City of Brea

Final

2010 Urban Water Management Plan

June 2011

MALCOLM PIRNIE | ARCADIS
The Water Division of ARCADIS

City of Brea

1 Civic Center Circle • Brea, CA 92821

2010 Urban Water Management Plan

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Contents

List of Tables

List of Figures

Appendices

Acronyms Used in the Report

20x2020	20% water use reduction in GPCD by year 2020
Act	Urban Water Management Planning Act
AF	acre-feet
AFY	acre-feet per year
BDCP	Bay Delta Conservation Plan
BMP	Best Management Practice
Board	Metropolitan's Board of Directors
CDR	Center for Demographic Research
CDWD	California Domestic Water Company
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CII	Commercial/Industrial/Institutional
CIMIS	California Irrigation Management Information System
City	City of Brea
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
DMM	Demand Management Measure
DWR	Department of Water Resources
EIR	Environmental Impact Report
EOCF #2	East Orange County Feeder #2
ETo	Evapotranspiration
Festival	Children's Water Education Festival
FY	Fiscal Year
GAP	Green Acres Project
GPCD	gallons per capita per day
gpm	gallons per minute
GWRS	Groundwater Replenishment System
H2O2	hydrogen peroxide
HECW	High Efficiency Clothes Washer
HET	high efficiency toilet
IRP	Integrated Water Resources Plan
IWA	International Water Association
LOI	Letter of Intent
LPCP	Landscape Performance Certification Program
MAF	million acre-feet
MCL	Maximum Contaminant Level
Metropolitan	Metropolitan Water District of Southern California
MF	Microfiltration
MG	million gallons

MGD	million gallons per day
MWDOC	Municipal Water District of Orange County
NDMA	N-nitrosodimethylamine
NOAA	National Oceanic and Atmospheric Administration
OCSD	Orange County Sanitation District
OCWD	Orange County Water District
Poseidon	Poseidon Resources LLC
PPCP	Pharmaceuticals and Personal Care Product
QSA	Quantification Settlement Agreement
RHNA	Regional Housing Needs Assessment
RO	Reverse Osmosis
RUWMP	Regional Urban Water Management Plan
SBx7-7	Senate Bill 7 as part of the Seventh Extraordinary Session
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SDCWA	San Diego County Water Authority
SGVMWD	San Gabriel Valley Municipal Water District
SWP	State Water Project
TDS	Total Dissolved Solids
TVMWD	Three Valleys Municipal Water District
ULFT	ultra-low-flush toilet
USBR	United States Bureau of Reclamation
USGVMWD	Upper San Gabriel Valley Municipal Water District
UV	ultraviolet
UWMP	Urban Water Management Plan
WACO	Water Advisory Committee of Orange County
WEROC	Water Emergency Response Organization of Orange County
WOCWBF #2	West Orange County Water Board Feeder #2
WSAP	Water Supply Allocation Plan
WSDM	Water Surplus and Drought Management Plan

Executive Summary

This report serves as the 2010 update of the City of Brea's (City) Urban Water Management Plan (UWMP). The UWMP has been prepared consistent with the requirements under Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (Act), which were added by Statute 1983, Chapter 1009, and became effective on January 1, 1984. The Act requires "every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually" to prepare, adopt, and file an UWMP with the California Department of Water Resources (DWR) every five years. 2010 UWMP updates are due to DWR by August 1, 2011.

Since its passage in 1983, several amendments have been added to the Act. The most recent changes affecting the 2010 UWMP include Senate Bill 7 as part of the Seventh Extraordinary Session (SBx7-7) and SB 1087. Water Conservation Act of 2009 or SBx7-7 enacted in 2009 is the water conservation component of the Delta package. It stemmed from the Governor's goal to achieve a 20% statewide reduction in per capita water use by 2020 (20x2020). SBx7-7 requires each urban retail water supplier to develop urban water use targets to help meet the 20% goal by 2020 and an interim 10% goal by 2015.

Service Area and Facilities

The City provides water to a population of 40,377 throughout its 10.7 square mile service area. The City receives its water from three main sources, the La Habra Basin, the Main San Gabriel Basin, which is managed by the California Domestic Water Company (CDWC) and imported water from the Municipal Water District of Orange County (MWDOC). Groundwater is pumped from one active well located within the City, and imported water from CDWC and Metropolitan through MWDOC.

Water Demand

Currently, the total water demand for retail customers served by the City is approximately 9,700 acre-feet annually consisting entirely of potable water. The City is projecting an 8.8% increase in demand in the next 25 years accompanying a projected 18% population growth.

With MWDOC's assistance, the City has selected to comply with **Option 1** of the SBx7-7 compliance options. The City is a member of the Orange County 20x2020 Regional Alliance formed by MWDOC. This regional alliance consists of 29 retail agencies in Orange County. Under Compliance Option 1, the City's 2015 interim water use target is 247.0 GPCD and the 2020 final water use target is **219.6 GPCD**.

Water Sources and Supply Reliability

The City has two primary sources of water supply. First is imported groundwater from the Main San Gabriel Basin through CDWC. The other is imported water from Metropolitan through MWDOC. The City also extracts local groundwater from the La Habra Basin. However, the one groundwater well owned by the City is used strictly for irrigation purposes. The sources of imported water supplies include the Colorado River and the State Water Project (SWP). Metropolitan's 2010 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full-service demands (non-interruptible agricultural and replenishment supplies) at the retail level under all foreseeable hydrologic conditions from 2015 through 2035.

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. Metropolitan's 2010 RUWMP finds that Metropolitan is able to meet full service demands of its member agencies with existing supplies from 2015 through 2035 during normal years, single dry year, and multiple dry years. The City is therefore capable of meeting the water demands of its customers in normal, single dry, and multiple dry years between 2015 and 2035, as illustrated in Table 3-12, Table 3-13, and Table 3-14, respectively.

Future Water Supply Projects

In Orange County, there are three proposed ocean desalination projects that could serve MWDOC and its member agencies with additional water supply. These are the Huntington Beach Seawater Desalination Project, the South Orange Coastal Desalination Project, and the Camp Pendleton Seawater Desalination Project.

1. Introduction

1.1. Urban Water Management Plan Requirements

Water Code Sections 10610 through 10656 of the Urban Water Management Planning Act (Act) require "every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually" to prepare, adopt, and file an UWMP with the California Department of Water Resources (DWR) every five years. 2010 UWMP updates are due to DWR by August 1, 2011.

This UWMP provides DWR with information on the present and future water resources and demands and provides an assessment of the City's water resource needs. Specifically, this document will provide water supply planning for a 25-year planning period in 5-year increments. The plan will also identify water supplies for existing and future demands, quantify water demands during normal year, single-dry year, and multiple-dry years, and identify supply reliability under the three hydrologic conditions. The City's 2010 UWMP update revises the 2005 UWMP. This document has been prepared in compliance with the requirements of the Act as amended in 2009, and includes the following analysis:

- Water Service Area and Facilities
- Water Sources and Supplies
- Water Use by Customer Type
- Demand Management Measures
- Water Supply Reliability
- Planned Water Supply Projects and Programs
- Water Shortage Contingency Plan
- Recycled Water

Since its passage in 1983, several amendments have been added to the Act. The most recent changes affecting the 2010 UWMP include Senate Bill 7 as part of the Seventh Extraordinary Session (SBx7-7) and SB 1087. Water Conservation Act of 2009 or SBx7-7 enacted in 2009 is the water conservation component of the historic Delta package. It stemmed from the Governor's goal to achieve a 20% statewide reduction in per capita water use by 2020 (20x2020). SBx7-7 requires each urban retail water supplier to develop urban water use targets to help meet the 20% goal by 2020 and the interim 10% goal by 2015. Each urban retail water supplier must include in its 2010 UWMPs the following information from its target-setting process:

- Baseline daily per capita water use
- 2020 Urban water use target
- 2015 Interim water use target
- Compliance method being used along with calculation method and support data

Wholesale water suppliers are required to include an assessment of present and proposed future measures, programs, and policies that would help achieve the 20 by 2020 goal.

The other recent amendment made to the UWMP Act to be included in the 2010 UWMP is set forth by SB 1087, Water and Sewer Service Priority for Housing Affordable to Low-Income Households. SB 1087 requires water and sewer providers to grant priority for service allocations to proposed developments that include low income housing. SB 1087 also requires UWMPs to include projected water use for single- and multi-family housing needed for low-income households.

The sections in this UWMP correspond to the outline of the Act, specifically Article 2, Contents of Plans, Sections 10631, 10632, and 10633. The sequence used for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of the City's water utility. The UWMP Checklist has been completed, which identifies the location of Act requirements in this Plan and is included as Appendix A.

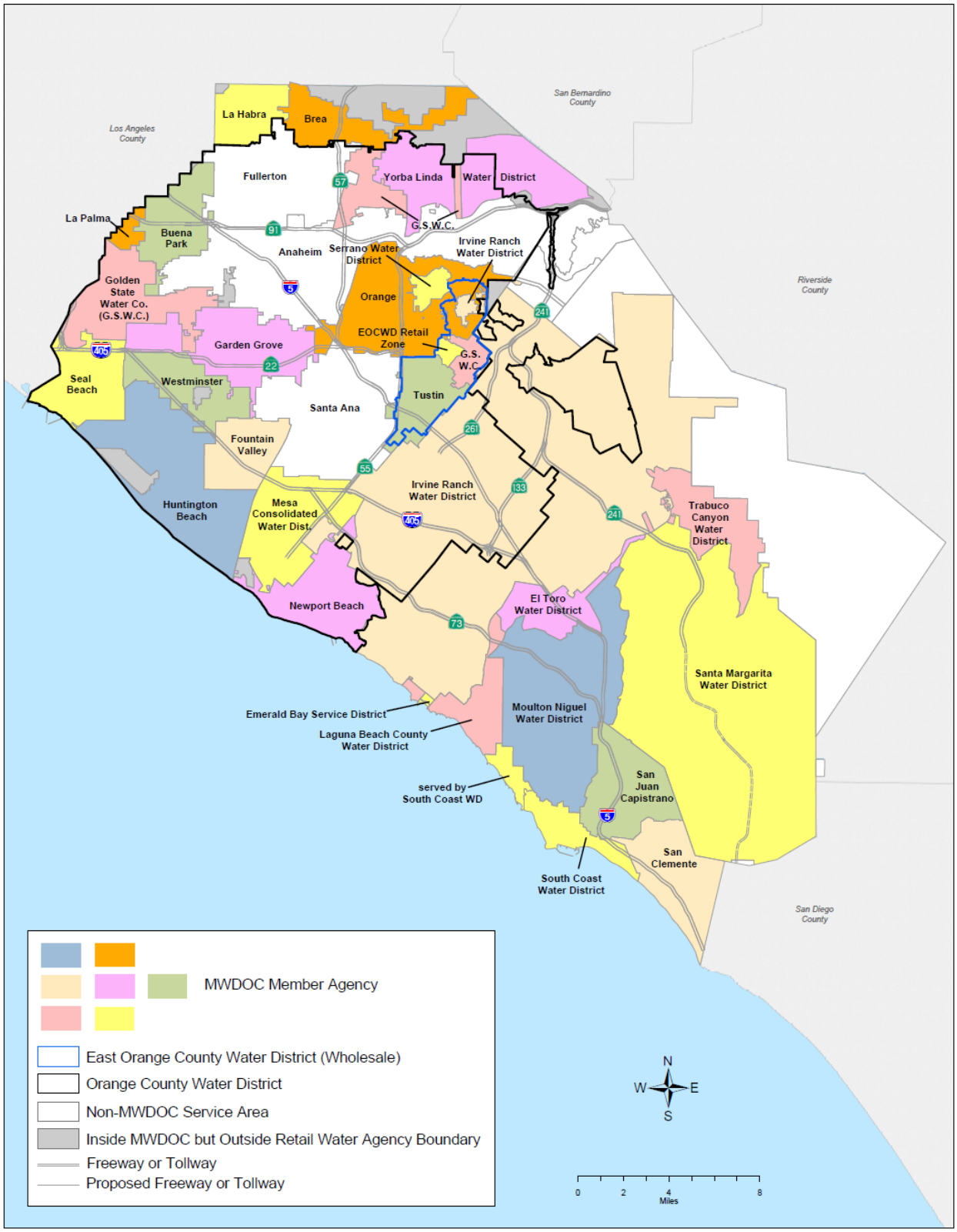

Figure 1-1: Regional Location of Urban Water Supplier

1.2. Agency Overview

The City provides potable water service to its population of approximately 40,000 through imported and local sources. The City's Water Division goal is to achieve conservation and efficient use of urban water supplies to protect the people of the City and their water sources and ensure that sufficient water supplies will be available for further beneficial use.

The City is governed by a five-member City Council, elected by residents to serve four-year terms. Each year, the Council elects one of its members to serve a one-year term as Mayor. As a General Law City, the Council appoints a City Manager to implement policies and oversee city departments. The current council members are:

- Roy Moore, Mayor
- Don Schweitzer, Mayor Pro Tem
- Ron Garcia, Councilmember
- Brett Murdock, Councilmember
- Marty Simonoff, Councilmember

The City receives its water from three main sources, the La Habra Basin, the Main San Gabriel Basin, which is provided by the California Domestic Water Company (CDWC), and imported water from the Municipal Water District of Orange County (MWDOC). MWDOC is Orange County's wholesale supplier and is a member agency of the Metropolitan Water District of Southern California (Metropolitan).

1.2.1. Brea's Service Area

The City is located in northern Orange County between the City of La Habra on the west, City of Fullerton on the southwest, the City of Yorba Linda on the southeast and the County of Los Angeles on the north (Figure 1-2). The City Water Division serves all the City's area except the Vesuvius track at the eastern end which is served by Yorba Linda Water District. The City has a current population of 40,377 and encompasses an area of approximately 10.7 square miles. The population increases to approximately 100,000 people during business hours due to the influx of business people coming to work and shoppers enjoying the popular regional shopping centers. The land use within the City is primarily residential, commercial and industrial, but has some land use of agriculture and oil production.

Of the approximately 7,100 acres, 26 percent are developed with residences, 17 percent with businesses, 4 percent with schools and major public facilities like the Civic and Cultural Center, and 14 percent with parks and other open spaces, with Chino Hills State Park representing a major open space feature. In addition to being a major retail center with one of the County's most popular regional shopping centers, the Brea Mall, the City

is also home to many large corporations, such as American Suzuki, Lucas- Western Aerospace, Beckman Instruments, and Bank of America.

The City offers easy access to Los Angeles, Riverside and San Bernardino Counties, and to a number of beaches, resorts, and tourist attractions. Orange County Airport is 17 miles away, Ontario Airport 25 miles away, and LAX 48 miles from the City. An Amtrak station and a municipal airport are located in the neighboring City of Fullerton, approximately 5 miles away. The City is 30 miles east of downtown Los Angeles. The Orange (57) Freeway bisects the City from north to south and offers easy access to the Riverside (91) Freeway to the south and the Pomona (60) and San Bernardino (10) Freeways to the north.

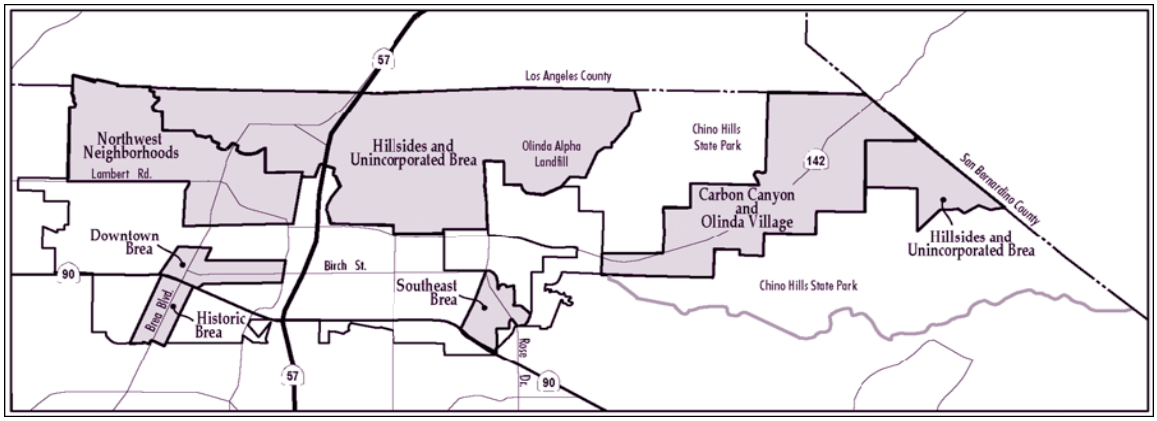

Figure 1-2: City of Brea's Service Area

1.2.2. Brea's Water Facilities

The City's distribution system consists of 162 miles of pipeline and six storage reservoirs ranging in size from 1.25 to 30 million gallons (MG). The storage system is supported with four booster stations. The booster pumps have a total capacity of 15,000 gallons per minute (gpm) serving five pressure zones.

The City also manages an irrigation well located at the Brea Creek Golf Course. The well has a turbine type vertical submersible pump with a 40 horse power motor that pumps 450 gpm serving the golf course.

2. Water Demand

2.1. Overview

Currently, the total water demand for retail customers served by the City is approximately 9,700 acre-feet annually consisting entirely of potable water. In the last five years, the City's water demand has decreased by about 13% while population has increased by 3%. With its diligence in the promotion of water conservation as well as financial incentives to customers to retrofit their homes and businesses with water efficient devices and appliances, the City is projecting an 8.8% demand increase in the next 25 years despite a projected 18% population growth.

The passage of SBx7-7 will increase efforts to reduce the use of potable supplies in the future. This new law requires all of California's retail urban water suppliers serving more than 3,000 AFY or 3,000 service connections to achieve a 20% reduction in demands (from a historical baseline) by 2020. Due to great water conservation efforts in the past decade, the City is on its way to meeting this requirement on its own. Moreover, the City has elected to join the Orange County 20x2020 Regional Alliance. The City together with other 28 retail agencies in Orange County are committed to reduce the region's water demand by 2020 through the leadership of the Municipal Water District of Orange County (MWDOC), the region's wholesale provider.

This section will explore in detail the City's current water demands by customer type and the factors which influence those demands as well as providing a perspective of its expected future water demands for the next 25 years. In addition, to satisfy SBx7-7 requirements, this section will provide details of the City's SBx7-7 compliance method selection, baseline water use calculation, and its 2015 and 2020 water use targets.

2.2. Factors Affecting Demand

Water consumption is influenced by many factors from climate characteristics of that hydrologic region, to demographics, land use characteristics, and economics. The key factors affecting water demand in the City's service area are discussed below.

2.2.1. Climate Characteristics

The City is located in an area known as the South Coast Air Basin (SCAB). The SCAB climate is characterized by southern California's "Mediterranean" climate: a semi-arid environment with mild winters, warm summers and moderate rainfall.

The City's average temperature ranges from 58°F in January to 74.3°F in August. Annual precipitation averages 14 inches, occurring mostly between November and March. The average evapotranspiration (ETo) is about 50 inches per year, which is almost four times the annual average rainfall. This translates to a high demand for landscape irrigation for homes, commercial properties, parks, and golf courses. Moreover, a region with low rainfall like Southern California is also more prone to droughts. Average annual ETo, temperatures and rainfall are shown in Table 2-1.

Table 2-1: Climate Characteristics

	Standard Monthly Average ETo (inches) [1]	Annual Rainfall (inches) [2]	Average Temperature (˚F) [3]
Jan	2.18	3.18	58.0
Feb	2.49	3.05	59.1
Mar	3.67	2.78	60.2
Apr	4.71	0.67	63.0
May	5.18	0.25	65.7
Jun	5.87	0.11	69.3
Jul	6.29	0.02	72.9
Aug	6.17	0.12	74.3
Sep	4.57	0.34	73.2
Oct	3.66	0.36	68.9
Nov	2.59	1.17	62.4
Dec	2.25	1.79	57.9
Annual	**49.63**	**13.84**	**65.4**

CIMIS Station #75, Irvine, California from October 1987 to Present
[2] NOAA, Santa Ana Fire Station, California 1971 to 2000, Mean Precipitation Total
[3] NOAA, Santa Ana Fire Station, California 1971 to 2000, Mean Temperature

The source of the City's imported water supplies, the State Water Project and Colorado River Project, is influenced by weather conditions in Northern California and along the Colorado River. Both regions have recently been suffering from multi-year drought conditions and record low rainfalls which directly impact demands and supplies to Southern California.

2.2.2. Demographics

The City's Water Division provides water to an existing population of 40,377 according to the California State University at Fullerton's Center of Demographics Research (CDR). The population is projected to increase by 18 percent by 2035 representing an average growth rate of 0.72 percent per year.

The City serves an estimated population of 40,377 people, and is growing slowly, as there is little remaining vacant land. The Center for Demographic Research (CDR) at California State University Fullerton projects an 18% increase in the City's population over the next 25 years. This represents an average growth rate of 0.72% per year. Only minimal changes in land use are anticipated over the next 25 years. Table 2-2 shows the population projections in five-year increments to the year 2035.

Table 2-2: Population – Current and Projected

	2010	2015	2020	2025	2030	2035-opt
Service Area Population [1]	40,377	41,832	43,296	44,761	46,225	47,689

[1] Center for Demographic Research, California State University, Fullerton 2010

2.2.3. Other Demographic Factors

The City's average household income as estimated by the 2002 Census is $84,457, well above the nation's average, and is above the median Orange County median family income of $78,600. Average household incomes are expected to increase 14.8% over the next five years to $96,936. Education levels are also high in the City, with 21 percent of the adult population earning bachelor's degrees and 10% earning graduate or professional degrees, colleges, universities and a number of technical and vocational schools are located in and around the City. California State University, Fullerton College, Pacific Christian College, Hope University, Western State University College of Law and Southern California College of Optometry are located in nearby Fullerton.

As the area's economy is beginning to improve, the City has seen a marked increase in development activity. There are several major new housing developments either in the planning stages, or under construction. The Tonner Hills project is in the City's unincorporated Sphere of Influence area to the north of the City boundary. Four developments, La Floresta, Stone Valley, The Village and the Trumark project are all within the City limits. In addition to these residential developments, the City continues to experience continued commercial and industrial development.

2.3. Water Use by Customer Type

The knowledge of an agency's water consumption by type of use or by customer class is key to developing that agency's water use profile which identifies when, where, how, and how much water is used, and by whom within the agency's service area. A comprehensive water use profile is critical to the assessment of impacts of prior conservation efforts as well as to the development of future conservation programs.

This section provides an overview of the City's water consumption by customer type in 2005 and 2010, as well as projections for 2015 to 2035. The customer classes are categorizes as follows: single-family residential, multi-family residential, commercial/industrial/institutional (CII), dedicated landscape, and agriculture. Other water uses including sales to other agencies and non-revenue water are also discussed in this section.

2.3.1. Overview

The City has approximately 11,800 customer connections to its water distribution system. The City is expected to add 2,700 more connections by 2035. All connections in the City's service area are metered. Approximately 54% of the City's water demand is residential. CII excluding dedicated landscape consume a third of the City water supply. Dedicated landscape sector accounts for 14% of the City's total demand. The City also provided sales to agriculture.

Tables 2-3 and 2-4 provide a summary of past, current, and projected water use by customer class and the number of water service customers by sector in five-year increments from 2005 through to 2035.

Table 2-3: Past, Current and Projected Service Accounts by Water Use Sector

Fiscal Year Ending	Number of Accounts by Water Use Sector							
	Single Family	Multi-Family	Commercial	Industrial	Institutional /Gov	Landscape	Agriculture	Total Accounts
2005	9,666	178	1,821				10	**11,675**
2010	9,790	180	1,843					**11,813**
2015	11,189	206	2,106					**13,500**
2020	11,355	209	2,137					**13,700**
2025	12,035	221	2,265					**14,522**
2030	12,035	221	2,265					**14,522**
2035	12,035	221	2,265					**14,522**

Table 2-4: Past, Current and Projected Water Demand by Water Use Sector

Fiscal Year Ending	Water Demand by Water Use Sectors (AFY)							
	Single Family	Multi-Family	Commercial	Industrial	Institutional /Gov	Landscape	Agriculture	Total Demand
2005	4,789	1,234	1,855	777	818	1,535	126	**11,133**
2010	4,259	986	1,426	642	1,013	1,387		**9,713**
2015	4,622	1,069	1,547	697	1,099	1,505		**10,539**
2020	4,798	1,110	1,606	723	1,141	1,563		**10,941**
2025	4,933	1,141	1,651	744	1,173	1,607		**11,249**
2030	4,977	1,152	1,666	750	1,184	1,621		**11,350**
2035	5,027	1,163	1,682	758	1,196	1,637		**11,463**

2.3.2. Residential

Residential water use accounts for the majority of the City's water demands. The single family residential sector accounts for approximately 44%, and multi-family residential accounts for 10% of the total water demand. Water consumption by the residential sector is projected to remain at 54% through the 25-year planning horizon.

2.3.3. Non-Residential

Non-residential demand is approximately 46% of the overall demand and is expected to remain so through to 2035. The City has a mix of commercial uses (markets, restaurants, etc.), public entities (such as schools, fire stations and government offices), office complexes, light industrial, warehouses and facilities serving the public. Within the non-residential sector, commercial uses are the most dominant at 15% of the City's total demand.

Large landscape demands accounts for 14% of the City's total water use. The City serves water to several parks and golf courses within its service boundary. These customers include the Carbon Canyon Regional Park (Orange County Parks Department), the Birch Hills Golf Course, the Brea Creek Golf Course, and several smaller neighborhood parks. The water used for large landscape irrigation purposes totals approximately 1,500 acre feet annually. These sites may be candidates for recycled water in the future, when it becomes available from MWDOC or from other sources.

2.3.4. Other Water Uses

2.3.4.1. Sales to Other Agencies

While the City does sell water outside of its service area, the City does not sell water to other agencies.

2.3.4.2. Non-Revenue Water

Non-revenue water is defined by the International Water Association (IWA) as the difference between distribution systems input volume (i.e. production) and billed authorized consumption. Non-revenue water consists of three components: unbilled authorized consumption (e.g. hydrant flushing, fire fighting, and blow-off water from well start-ups), real losses (e.g. leakage in mains and service lines), and apparent losses (unauthorized consumption and metering inaccuracies).

The City's non-revenue water accounts for less than 10% of the City's total water use (Table 2-5).

Table 2-5: Additional Water Uses and Losses (AFY)

Water Use	Fiscal Year Ending						
	2005	2010	2015	2020	2025	2030	2035
Saline Barriers							
Groundwater Recharge							
Conjunctive Use							
Raw Water							
Recycled Water							
Unaccounted-for System Losses	1,002	874	949	985	1,012	1,022	1,032
Total	**1,002**	**874**	**949**	**985**	**1,012**	**1,022**	**1,032**

2.4. SBx7-7 Requirements

2.4.1. Overview

SBx7-7, which became effective on February 3, 2010, is the water conservation component to the Delta legislative package. It seeks to implement Governor Schwarzenegger's 2008 water use reduction goals to achieve a 20% statewide reduction in urban per capita water use by December 31, 2020. As discussed above, the bill requires each urban retail water supplier to develop urban water use targets to help meet the 20% goal by 2020 and an interim 10% goal by 2015. The bill establishes methods for urban retail water suppliers to determine targets to help achieve water reduction targets. The retail water supplier must select one of the four target-setting methods (compliance options). The retail agency may choose to comply to SBx7-7 as an individual or as a region in collaboration with other water suppliers. Under the regional compliance option, the retail water supplier still has to report the water use target for its individual service area. The bill also includes reporting requirements in the 2010, 2015, and 2020 UWMPs. An agency that does not comply with SBx7-7 requirement will not be eligible for water related grant, or loan, from the state on and after July 16, 2016. However, if an agency that is not in compliance documents a plan and obtains funding approval to come into compliance then could become eligible for grants or loans.

2.4.2. SBx7-7 Compliance Method

DWR has established four compliance options for urban retail water suppliers to choose from. Each supplier is required to adopt one of the four options to comply with SBx7-7 requirements. The four options include:

- *Option 1* requires a simple 20% reduction from the baseline by 2020 and 10% by 2015.
- *Option 2* employs a budget-based approach by requiring an agency to achieve a performance standard based on three metrics
    - Residential indoor water use of 55 GPCD
    - Landscape water use commiserate with Model Landscape Ordinance
    - 10 percent reduction in baseline CII water use
- *Option 3* is to achieve 95% of the applicable state hydrologic region target as set forth in the State's 20x2020 Water Conservation Plan.
- *Option 4* requires the subtraction of Total Savings from the Base GPCD:
    - Total Savings includes indoor residential savings, meter savings, CII savings, and landscape and water loss savings.

Brea's Compliance Option Selection

With MWDOC's assistance in the calculation of the City's base daily per capita use and water use targets, the City has selected to comply with **Option 1**.

While each retail agency is required to choose a compliance option in 2010, DWR allows for the agency to change its compliance option in 2015. This will allow the City to determine its water use targets for Compliance Option 2 and 4 as it anticipates more data to be available for targets calculation in the future.

2.4.3. Regional Alliance

As discussed above, retail agencies can choose to meet the SBx7-7 targets on its own or several retail agencies may form a regional alliance and meet the water use targets as a region. The benefit for an agency that joins a regional alliance is that it has multiple means of meeting compliance.

The City is a member of the Orange County 20x2020 Regional Alliance formed by MWDOC. This regional alliance consists of 29 retail agencies in Orange County as described in MWDOC's 2010 RUWMP. The Regional Alliance Weighted 2015 target is 174 GPCD and 2020 target is 157 GPCD.

2.4.4. Baseline Water Use

The first step to calculating an agency's water use targets is to determine its base daily per capita water use (baseline water use). This baseline water use is essentially the

agency's gross water use divided by its service area population, reported in gallons per capita per day (GPCD). The baseline water use is calculated as a continuous 10-year average during a period, which ends no earlier than December 31, 2004 and no later than December 31, 2010. Agencies that recycled water made up 10% or more of 2008 retail water delivery can use up to a 15-year average for the calculation.

Recycled water use was less than 10% of the City's retail delivery in 2008; therefore, a 10-year instead of a 15-year rolling average was calculated. The City's baseline water use is **274.5 GPCD,** which was obtained from the 10-year period July 1, 1995 to June 30, 2005.

Tables 2-6 and 2-7 provide the base period ranges used to calculate the baseline water use for the City as well as the service area population and annual water use data which the base daily per capita water use was derived. Data provided in Table 2-6 was used to calculate the continuous 10-year average baseline GPCD. Moreover, regardless of the compliance option adopted by the City, it will need to meet the minimum water use target of 5% reduction from a five-year baseline as calculated in Table 2-7.

Table 2-6: Base Daily per Capita Water Use – 10-year range

Highest Available Baseline [1]	Beginning	Ending
10 Year Avg	July 1, 1995	June 30, 2005

Fiscal Year Ending	Service Area Population	Gross Water Use (gallons per day)	Daily Per Capita Water Use
1996	34,082	9,955,953	292
1997	34,374	10,260,914	299
1998	34,691	9,192,391	265
1999	35,008	9,865,072	282
2000	35,433	10,581,319	299
2001	35,915	9,448,876	263
2002	36,865	10,192,619	276
2003	37,895	9,318,714	246
2004	38,915	10,619,172	273
2005	39,379	9,867,750	251
		Base Daily Per Capita Water Use:	274.5

[1] The most recent year in base period must end no earlier than December 31, 2004, and no later than December 31, 2010. The base period cannot exceed 10 years unless at least 10 percent of 2008 retail deliveries were met with recycled water.

Table 2-7: Base Daily per Capita Water Use – 5-year range

Highest Available Baseline [2]	Beginning	Ending
5 Year Avg	July 1, 2003	June 30, 2008

Fiscal Year Ending	Service Area Population	Gross Water Use (gallons per day)	Daily Per Capita Water Use
2004	38,915	10,619,172	273
2005	39,379	9,867,750	251
2006	39,422	9,834,094	249
2007	39,531	10,899,225	276
2008	39,861	10,194,583	256
		Base Daily Per Capita Water Use:	260.9

[2] The base period must end no earlier than December 31, 2007, and no later than December 31, 2010.

2.4.5. SBx7-7 Water Use Targets

Under Compliance Option 1, the simple 20% reduction from the baseline, the City's 2015 interim water use target is 247.0 GPCD and the 2020 final water use target is **219.6 GPCD** as summarized in Table 2-8.

Table 2-8: Preferred Compliance Option and Target Water Use

	Baseline	2015 Target	2020 Target
Option 1 - Simple 20% Reduction	274.5	247.0	219.6

2.4.6. Water Use Reduction Plan

The City is a member agency of MWDOC and a member of the Orange County 20x2020 Regional Alliance comprising 29 retail urban water suppliers in Orange County. The Orange County 20x2020 Regional Alliance was created to allow local water suppliers to meet their 20% by 2020 reduction targets under SBx7-7 on a regional basis through the successful implementation of region-wide programs.

The Orange County 20x2020 Regional Alliance will achieve its water use reduction by building on the existing collaboration between Metropolitan, MWDOC and the local agencies in Orange County. MWDOC as a regional wholesale water provider implements many of the urban water conservation Best Management Practices (BMPs) on behalf its member agencies. MWDOC's conservation measures are detailed in MWDOC's RUWMP Section 4, and Metropolitan's conservation measures detailed in Metropolitan's 2010 RUWMP Section 3.4.

Additionally, Metropolitan in collaboration with MWDOC and other Metropolitan member agencies is in the process of developing a Long Term Conservation Plan,[1] which seeks an aggressive water use efficiency target in order to achieve a 20% reduction in per capita water use by 2020 for the entire Metropolitan service area.

Metropolitan Long Term Conservation Plan

Metropolitan's Long Term Conservation Plan will build on Metropolitan's traditional programs of incentives, education and broad outreach while developing a new vision of water use efficiency by altering the public's perspective on water through market transformation. The overreaching goals of the Long Term Conservation Plan are as follows:

- Achieve the 2010 IRP conservation target – The target for new water savings through conservation is a regional per capita use of 159 gallons per day in 2015 and 141 gallons per day in 2020.
- Pursue innovation that will advance water conservation
- Transform the public's value of water within this region – A higher value on water within this region can lead to a conservation ethic that results in permanent change in water use behavior, earlier adoption of new water saving technologies, and transition towards climate-appropriate landscapes.

Achieving these goals requires the use of integrated strategies that leverage the opportunities within this region. It requires regional collaboration and sustained support for a comprehensive, multi-year program. It requires a commitment to pursue behavioral changes and innovation in technologies that evolve the market for water efficient devices and services. It requires strategic, focused implementation approaches that build from broad-based traditional programs. It requires that research be conducted to provide the basis for decisions. Lastly, it requires the support of local leaders to communicate a new value standard for water within this region. Metropolitan and its member agencies will implement the five strategies through a traditional program, a market acceleration program, and legislation and regulation. The five strategies include:

- **Use catalysts for market transformation.** Metropolitan and member agencies will pursue market transformation to affect the market and consumer choices for water efficient devices and services.
- **Encourage action through outreach and education.** Metropolitan and member agencies will provide outreach, educational workshops, and training classes through a range of media and formats which are essential to changing public perceptions of the value of water.

[1] Metropolitan Water District of Southern California Long Term Conservation Plan Working Draft Version 6 (November 30, 2010)

- **Develop regional technical capability.** Metropolitan and member agencies will conduct research, facilitate information sharing, and/or provide technical assistance to member agencies and retail agencies to develop technical capabilities within the region for water budgeting, advanced metering infrastructure, ordinances, retail rate structures, and other conservation measures.
- **Build strategic alliances.** Metropolitan and member agencies will form strategic alliances with partners to leverage resources, opportunities and existing momentum that support market transformation.
- **Advance water efficiency standards.** Metropolitan and member agencies will work to advance water efficiency codes and standards to increase efficiency and reduce water waste.

Successful market transformation requires the integrated use of all five strategies. It is implemented through three complementary programs: traditional and market acceleration programs, and legislation and regulation. When used together, these approaches can be catalytic and transform markets.

Traditional Program: A traditional program of incentives, outreach, education, and training will be used to provide a foundation of water savings, establish baseline conditions, provide market data, and help determine devices and services that are primed for market acceleration. Implementation may include regional incentive programs, pilot programs, regional outreach, and research for a variety of devices and services.

Market Acceleration Program: A portion of Metropolitan's resources will be used for market acceleration of devices and services that have potential for market change. Metropolitan will use a strategic focus for a specified time period to affect the market for a particular device or service. Tactics may include strategic outreach to manufacturers, retailers, contractors, and consumers; enhanced incentives; and collaboration on implementation.

Legislation and Regulation: Are important tools and often the primary means for ensuring future water savings from devices and services. Regulation, ordinances and codes establish conditions that will ensure a minimum level of water efficiency for a particular device or service in the future. Markets are dynamic, and the influences on manufactures, retailers, and consumers are constantly changing. Progress made on changing consumer preferences a market share of efficient products is protected through legislation and regulations requiring a minimum efficiency standard. This benefits both water agencies and manufactures who invest in bringing water-efficiency technologies to the market. Legislation and regulation are also effective exit strategies to discontinue traditional incentive programs so that resources can be redirected to new technologies and approaches.

Implementation of the combined programs, Traditional - Market Acceleration – Legislation and Regulation, will be closely coordinated between Metropolitan, member agencies and sub-agencies to maximize synergies. An adaptive management approach will be employed using research, implementation and evaluation to guide decisions on program activities and intensity.

Periodic Review

A periodic review of conservation actions to measure progress towards the water savings goals will be an integral component of the effort. The review will include work that is completed or in progress. It will consider factors that have affected the results as well as the opportunities to improve cost effectiveness and water savings.

2.5. Demand Projections

2.5.1. 25 Year Projections

One of the main objectives of this UWMP is to provide an insight into the City's future water demand outlook. As discussed above, currently, the City's total water demand is 9,713 acre-feet, which is met through a combination of 79% local and imported groundwater and 21% imported water. Table 2-9 provides a projection of the City's water demand for the next 25 years.

Table 2-9: Current and Projected Water Demands (AFY)

Water Supply Sources	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035-opt
MWDOC(Imported Treated Full Service (non-int.))	2,036	2,429	2,831	3,139	3,240	3,353
La Habra Basin	99	110	110	110	110	110
Cal Domestic	7,578	8,000	8,000	8,000	8,000	8,000
Total	**9,713**	**10,539**	**10,941**	**11,249**	**11,350**	**11,463**

The City's 25-year demand projections for imported water shown in Table 2-10 are based on the projections provided by the City to MWDOC. As the regional wholesale supplier of Orange County, MWDOC works in collaboration with each of its member agencies as well as with Metropolitan, its wholesaler, to develop demand projections for imported water. Table 2-10 also shows the City's demand projections for imported groundwater provided to CDWC, its wholesaler. The City plans to purchase more imported groundwater supply from Cal Domestic Water Company (CDWC) to meet its increasing demands in the next 25 years, up to 8,000 AFY starting in 2015.

Table 2-10: Brea's Demand Projections Provided to Wholesale Suppliers (AFY)

Wholesales	Fiscal Year Ending				
	2015	2020	2025	2030	2035-opt
MWDOC	2,429	2,831	3,139	3,240	3,353
CDWC (Imported Groundwater)	8,000	8,000	8,000	8,000	8,000

2.5.2. Low Income Household Projections

One significant change to the UWMP Act since 2005 is the requirement for retail water suppliers to include water use projections for single-family and multifamily residential housing needed for lower income and affordable households. This requirement is to assist the retail suppliers in complying with the requirement under Section 65589.7 of the Government Code that suppliers grant a priority for the provision of service to housing units affordable to lower income households. A lower income household is defined as a household earning 80% of the County of Orange's median income or less.

In order to identify the planned lower income housing projects within its service area, DWR[2] recommends that retail suppliers may rely on Regional Housing Needs Assessment (RHNA) or Regional Housing Needs Plan information developed by the local council of governments, the California Department of Housing and Community Development.

The RHNA is an assessment process performed periodically as part of Housing Element and General Plan updates at the local level. Regional Council of Governments in California are required by the State Housing Element Law enacted in 1980 to determine the existing and projected regional housing needs for persons at all income levels. The RHNA quantifies the need for housing by income group within each jurisdiction during specific planning periods. The RHNA is used in land use planning, to prioritize local resource allocation and to help decide how to address existing and future housing needs. The RHNA consists of two measurements: 1) existing need for housing, and 2) future need for housing.

The current RHNA planning period is January 1, 2006 to June 30, 2014 completed by the Southern California Association of Governments (SCAG) in 2007. The next RHNA which will cover the planning period of January 1, 2011 to September 30, 2021 is not expected to be completed until fall of 2012; therefore, the 2007 RHNA will be used for the purpose of this 2010 UWMP.

[2] California Department of Water Resources, Guidebook to Assist Urban Water Suppliers to Prepare a 2010 UWMP, Final (March 2011)

Based on the 2007 Final Regional Housing Need Allocation Plan[3], the projected housing need for low and very low income households (hereafter referred to as low-income) in the City of Brea are 17.4% and 21.5%, respectively or 38.9% combined.

Therefore, from inference, it is estimated that approximately 38.9% of the projected water demands within the City's service area will be for housing needed for low income households. Table 2-11 provides a breakdown of the projected water needs for low income single family and multifamily units. The projected water demands shown here represent 38.9% of the projected water demand by customer type for single-family and multifamily categories provided in Table 2-4 above. For example, the total single family residential demand is projected to be 4,622 AFY in 2015 and 5,027 AFY in 2035. The projected water demands for housing needed for single family low income households are 1,798 and 1,956 AFY for 2015 and 2035, respectively.

Table 2-11: Projected Water Demands for Housing Needed for Low Income Households (AFY)

Water Use Sector	Fiscal Year Ending				
	2015	2020	2025	2030	2035-opt
Total Retail Demand	10,539	10,941	11,249	11,350	11,463
Total Residential Demand	5,691	5,908	6,074	6,129	6,190
Total Low Income Households Demand	***2,214***	***2,298***	***2,363***	***2,384***	***2,408***
SF Residential Demand - Total	4,622	4,798	4,933	4,977	5,027
SF Residential Demand - Low Income Households	***1,798***	***1,866***	***1,919***	***1,936***	***1,956***
MF Residential Demand - Total	1,069	1,110	1,141	1,152	1,163
MF Residential Demand - Low Income Households	***416***	***432***	***444***	***448***	***452***

[3] Southern California Association Governments, Final Regional Housing Need Allocation Plan for Jurisdictions within the Six County SCAG Region (July 2007)

3. Water Sources and Supply Reliability

3.1. Overview

The City has two primary sources of water supply. First is imported groundwater from the Main San Gabriel Basin through CDWC. The other is imported water from Metropolitan through MWDOC. The City also extracts local groundwater from the La Habra Basin. However, the one groundwater well owned by the City is used strictly for irrigation purposes.

The sources of imported water supplies include the Colorado River and the State Water Project (SWP). Metropolitan's 2010 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full-service demands (non-interruptible agricultural and replenishment supplies) at the retail level under all foreseeable hydrologic conditions from 2015 through 2035. The imported water supply numbers shown here represent only the amount of supplies projected to meet demands and not the full supply capacity.

Figure 3-1 provides a projection of the City's water supply sources for the next 25 years. Imported groundwater supply currently makes up almost 80% of the City's water supply portfolio with imported water from MWDOC/Metropolitan at just under 20%. To meet the projected 18% growth in demand, the City is expected to max out imported groundwater purchase from CDWC at 8,000 AFY and purchase more imported water from Metropolitan/MWDOC to make up the balance.

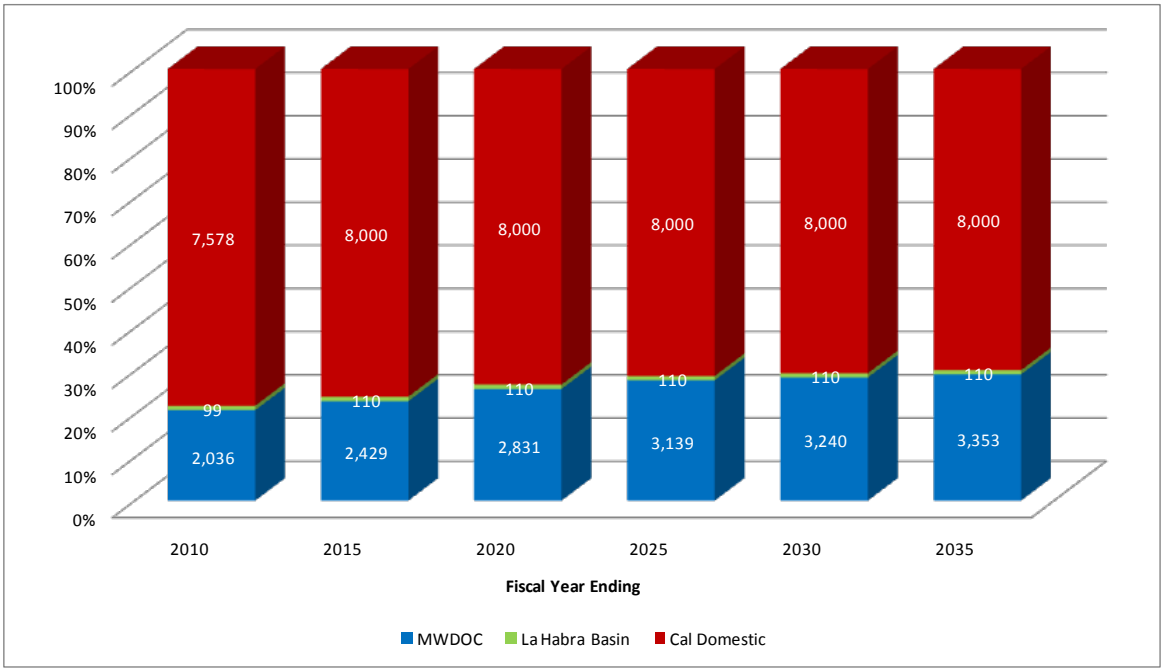

Figure 3-1: Current and Projected Water Supplies (AFY)

The following sections provide a detailed discussion of the City's water sources as well as projections to the City's future water supply portfolio for the next 25 years. Moreover, the City's projected supply and demand are compared under various hydrological conditions to determine the City's supply reliability for the 25 year planning horizon. This section satisfies the requirements of § 10631 (b) and (c), and 10635 of the Water Code.

3.2. Imported Water

3.2.1. Imported Groundwater Supply (CDWC)

The City obtains imported groundwater supply from CDWC, a mutual water company. The CDWC provides groundwater from the Main San Gabriel Basin to each of its member agencies who own and/or lease stock in the company. The City owns 1,656 shares and leases another 188 shares which translates to 2,673.8 AF (each share is worth 1.45 AF for FY 2010-11). However, the City is able to receive more than its shares by paying for the replenishment fees. The maximum available water to the City from CDWC totals 8,000 AFY. The amount of water the City can receive annually from CDWC is limited by the capacity of the facilities transmitting water from the CDWC system to the City system.

Each CDWC member agency receives a prescribed entitlement to water based upon the number of shares owned and the safe yield of the Main San Gabriel Basin. The member agency entitlement criterion per share varies year by year, based on CDWC's allotted

percentage and the Basin Operating Safe Yield of the Main San Gabriel Basin. The Basin Operating Safe Yield is determined annually by the Main San Gabriel Basin Watermaster, the agency which was created by the Main San Gabriel Judgment to manage the Main San Gabriel Basin. Historically, this has been about 1.38 to 1.85 acre–feet per share. The voluntary adjudication of the Main San Gabriel Water Basin provided CDWC 5.60 percent of the basin's safe yield (with purchased water rights totaling 6.11 percent).

Main San Gabriel Basin

The Main San Gabriel Basin lies in eastern Los Angeles County. The hydrologic basin or watershed coincides with a portion of the upper San Gabriel River watershed, and the aquifer or groundwater basin underlies most of the San Gabriel Valley.

Surface area of the groundwater basin is approximately 167 square miles and has a fresh water storage capacity of the basin is estimated to be about 8.6 million acre-feet.

The physical groundwater basin is divided into two main parts, the Main Basin and the Puente Subbasin. The Puente Subbasin, lying in the southeast portion is hydraulically connected to the Main Basin. However, it is not the legal jurisdiction of the Main San Gabriel Basin Watermaster, and is thus considered a separate entity for management purposes.

Main San Gabriel Basin Judgment

Rapid urbanization in the San Gabriel Valley in the 1940s caused an increased demand for groundwater drawn from the Main San Gabriel Basin from the Upper Area users. This resulted in the decrease in available water supply for the Lower Area and downstream users. In 1968, at the request of producers, the Upper San Gabriel Municipal Water District filed a complaint that would adjudicate water rights in the Basin and would bring all Basin producers under control of one governing body. The final result was the entry of the Main San Gabriel Basin Judgment in 1973.

The Judgment defined the water rights of 190 original parties to the legal action. It created a new governing body, the Main San Gabriel Basin Watermaster, and described a program for management of water in the Basin. The Main San Gabriel Basin Watermaster manages and controls the withdrawal and replenishment of water supplies in the Basin. It determines annually the Operating Safe Yield (the amount of groundwater that can safely be extracted) for the succeeding fiscal year, and notifies the pumpers of their shares thereof.[4]

[4] http://www.watermaster.org/projects.html

Under the terms of the Main San Gabriel Basin Judgment all rights to the diversion of surface water and production of groundwater within the Main Basin and its Relevant Watershed were adjudicated. The Main Basin Judgment does not restrict the quantity of water which Parties may extract from the Main Basin. Rather, it provides a means for replacing with Supplemental Water all annual extractions in excess of a Party's annual right to extract water. The Main Basin Watermaster annually establishes an Operating Safe Yield for the Main Basin which is then used to allocate to each Party its portion of the Operating Safe Yield which can be produced free of a Replacement Water Assessment. If a producer extracts water in excess of his right under the annual Operating Safe Yield, it must pay an assessment for Replacement Water, which is sufficient to purchase one acre-foot of Supplemental Water to be spread in the basin for each acre-foot of excess production. All water production is metered and is reported quarterly to the Main Basin Watermaster.

In addition to Replacement Water Assessments, the Main Basin Watermaster levies an Administration Assessment to fund the administration of the Main Basin management program under the Main Basin Judgment and a Make-up Obligation Assessment in order to fulfill the requirements for any make-up Obligation under the Long Beach Judgment and to supply fifty percent of the administration costs of the River Watermaster service. The Main Basin Watermaster levies an In-lieu Assessment and may levy special Administration Assessments.

Water rights under the Main Basin Judgment are transferable by lease or purchase so long as such transfers meet the requirements of the Judgment. There is also provision for Cyclic Storage Agreements by which Parties and non-parties may store imported supplemental water in the Main Basin under such agreements with the Main Basin Watermaster pursuant to uniform rules and conditions and Court approval.

The Main Basin Watermaster has entered into a Cyclic Storage Agreement with each of the three municipal water districts. One is with Metropolitan and the Upper San Gabriel Valley Municipal Water District (USGVMWD), which permits Metropolitan to deliver and store imported water in the Main Basin in an amount not to exceed 100,000 acre-feet for future Replacement Water use. The second Cyclic Storage Agreement is with Three Valleys Municipal Water District (TVMWD) and permits Metropolitan to deliver and store 40,000 acre-feet for future Replacement Water use. The third is with San Gabriel Valley Municipal Water District (SGVMWD) and contains generally the same conditions as the agreement with Metropolitan except that the stored quantity is not to exceed 40,000 acre-feet. CDWC has a Cyclic Storage account and is allowed to store a maximum of 15,000 acre-feet at any given time. As of June 30, 2004 CDWC had 1,133.61 acre-feet in its Cyclic Storage account.

The City owns 1,656 shares and leases another 188 shares from CDWC which translate to a pumping right of 2,673.8 AFY from the Main San Gabriel Basin (Table 3-1). However, the City is able to obtain more than its shares by paying for the replenishment fees. The maximum amount that the City can purchase from CDWC is 8,000 AFY.

The City also produces local groundwater from the La Habra Basin. The La Habra is a non-adjudicated basin therefore no groundwater rights exist.

Table 3-1: Groundwater Pumping Rights (AFY)

Basin Name	Pumping Right (AFY)
La Habra Basin	N/A (non-adjudicated)
Main San Gabriel Basin (CDWC)	2,673.8
Total	**2,673.8**

Imported water is purchased from Metropolitan through MWDOC. Imported potable water delivered to the City comes from the Robert B. Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and State Water Project (SWP) water through the Yorba Linda Feeder.

3.2.2. Imported Supply (MWDOC)

Imported water is purchased from Metropolitan through MWDOC. Imported potable water delivered to the City comes from the Robert B. Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and State Water Project (SWP) water through the Yorba Linda Feeder. The City also receives water through the OC-6 (10 cfs) connection which receives water from the 36-inch Orange County Feeder and the Weymouth Filtration Plant located in the City of La Verne.

3.2.3. Metropolitan's 2010 Regional Urban Water Management Plan

Metropolitan's 2010 Regional Urban Water Management Plan (RUWMP) reports on its water reliability and identifies projected supplies to meet the long-term demand within its service area. It presents Metropolitan's supply capacities from 2015 through 2035 under the three hydrologic conditions specified in the Act: single dry-year, multiple dry-years, and average year.

Colorado River Supplies

Colorado River Aqueduct supplies include supplies that would result from existing and committed programs and from implementation of the Quantification Settlement

Agreement (QSA) and related agreements to transfer water from agricultural agencies to urban uses. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 MAF on an as-needed basis.

State Water Project Supplies

Metropolitan's State Water Project (SWP) supplies have been impacted in recent years by restrictions on SWP operations in accordance with the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fishery Service issued on December 15, 2008 and June 4, 2009, respectively. In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. The goal of the storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Banks pumping capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

In June 2007, Metropolitan's Board approved a Delta Action Plan that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance and the environment. The Delta action plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Bay-Delta while the long-term solution is implemented.

State and federal resource agencies and various environmental and water user entities are currently engaged in the development of the Bay Delta Conservation Plan (BDCP), which is aimed at addressing the basic elements that include the Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development. In evaluating the supply capabilities for the 2010 RUWMP, Metropolitan assumed a new Delta conveyance is fully operational by 2022 that would return supply reliability similar to 2005 condition, prior to supply restrictions imposed due to the Biological Opinions.

Storage

Storage is a major component of Metropolitan's dry year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing its Water Supply Allocation Plan (WSAP), is dependent on its storage resources. In developing the supply capabilities for the 2010 RUWMP, Metropolitan assumed a simulated median storage level going into each of five-year increments based on the balances of supplies and demands.

Supply Reliability

Metropolitan evaluated supply reliability by projecting supply and demand conditions for the single- and multi-year drought cases based on conditions affecting the SWP (Metropolitan's largest and most variable supply). For this supply source, the single driest-year was 1977 and the three-year dry period was 1990-1992. Metropolitan's analyses are illustrated in Tables 3-2, 3-3, and 3-4 which correspond to Metropolitan's 2010 RUWMP's Tables 2-11, 2-9 and 2-10, respectively. These tables show that the region can provide reliable water supplies not only under normal conditions but also under both the single driest year and the multiple dry year hydrologies.

Table 3-2: Metropolitan Average Year Projected Supply Capability and Demands for 2015 to 2035

AverageYear
Supply Capability[1] and Projected Demands
Average of 1922-2004 Hydrologies
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct[2]	1,550,000	1,629,000	1,763,000	1,733,000	1,734,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,507,000	1,529,000	1,472,000	1,432,000	1,429,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**3,485,000**	**3,810,000**	**4,089,000**	**3,947,000**	**3,814,000**
Demands					
Firm Demands of Metropolitan	1,826,000	1,660,000	1,705,000	1,769,000	1,826,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,006,000**	**1,933,000**	**1,985,000**	**2,049,000**	**2,106,000**
Surplus	**1,479,000**	**1,877,000**	**2,104,000**	**1,898,000**	**1,708,000**
Programs Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	382,000	383,000	715,000	715,000	715,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**588,000**	**689,000**	**1,051,000**	**1,051,000**	**1,051,000**
Potential Surplus	**2,067,000**	**2,566,000**	**3,155,000**	**2,949,000**	**2,759,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 3-3: Metropolitan Single-Dry Year Projected Supply Capability and Demands for 2015 to 2035

Single Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1977 Hydrology
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	685,000	931,000	1,076,000	964,000	830,000
California Aqueduct[2]	522,000	601,000	651,000	609,000	610,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,416,000	1,824,000	1,669,000	1,419,000	1,419,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,457,000**	**2,782,000**	**2,977,000**	**2,823,000**	**2,690,000**
Demands					
Firm Demands of Metropolitan	1,991,000	1,889,000	1,921,000	1,974,000	2,039,000
IID-SDCWA Transfers and Canal Linings	180,000	273,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,171,000**	**2,162,000**	**2,201,000**	**2,254,000**	**2,319,000**
Surplus	**286,000**	**620,000**	**776,000**	**569,000**	**371,000**
Programs Under Development					
In-Region Storage and Programs	206,000	306,000	336,000	336,000	336,000
California Aqueduct	556,000	556,000	700,000	700,000	700,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**762,000**	**862,000**	**1,036,000**	**1,036,000**	**1,036,000**
Potential Surplus	**1,048,000**	**1,482,000**	**1,812,000**	**1,605,000**	**1,407,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 3-4: Metropolitan Multiple-Dry Year Projected Supply Capability and Demands for 2015 to 2035

Multiple Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1990-1992 Hydrology
(acre-feet per year)

Forecast Year	2015	2020	2025	2030	2035
Current Programs					
In-Region Storage and Programs	246,000	373,000	435,000	398,000	353,000
California Aqueduct[2]	752,000	794,000	835,000	811,000	812,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	1,318,000	1,600,000	1,417,000	1,416,000	1,416,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,248,000**	**2,417,000**	**2,520,000**	**2,459,000**	**2,415,000**
Demands					
Firm Demands of Metropolitan	2,056,000	1,947,000	2,003,000	2,059,000	2,119,000
IID-SDCWA Transfers and Canal Linings	180,000	241,000	280,000	280,000	280,000
Total Demands on Metropolitan[5]	**2,236,000**	**2,188,000**	**2,283,000**	**2,339,000**	**2,399,000**
Surplus	**12,000**	**229,000**	**237,000**	**120,000**	**16,000**
Programs Under Development					
In-Region Storage and Programs	162,000	280,000	314,000	336,000	336,000
California Aqueduct	242,000	273,000	419,000	419,000	419,000
Colorado River Aqueduct					
Colorado River Aqueduct Supply[3]	187,000	187,000	187,000	182,000	182,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**404,000**	**553,000**	**733,000**	**755,000**	**755,000**
Potential Surplus	**416,000**	**782,000**	**970,000**	**875,000**	**771,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

[5] Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

3.2.4. Brea's Imported Water Supply Projections

Based on Metropolitan's supply projections that it will be able to meet full service demands under all three hydrologic scenarios, MWDOC, Orange County's wholesale supplier projects that it would also be able to meet the demands of its retail agencies under these conditions.

California Water Code section 10631 (k) requires the wholesale agency to provide information to the urban retail water supplier for inclusion in its UWMP that identifies and quantifies the existing and planned sources of water available from the wholesale agency. Table 3-5 indicates the wholesaler's water availability projections by source for the next 25 years as provided to the City by MWDOC and CDWC. The water supply projections shown in Table 3-5 represent the amount of supplies projected to meet demands. They do not represent the full supply capacity.

Table 3-5: Wholesaler Identified & Quantified Existing and Planned Sources of Water

Wholesaler Sources	Fiscal Year Ending				
	2015	2020	2025	2030	2035-opt
MWDOC	2,429	2,831	3,139	3,240	3,353
CDWC	8,000	8,000	8,000	8,000	8,000

3.3. Groundwater

3.3.1. Local Groundwater Supply (La Habra Basin)

In addition to imported groundwater from the Main San Gabriel Basin through CDWC, the City also obtains local groundwater from the La Habra Basin. The La Habra Groundwater Basin, located directly beneath the City, has poor water quality that would require extensive treatment and blending with higher quality water to meet the State's public health standards. The one groundwater well owned by the City is used strictly for irrigation purposes.

La Habra Groundwater Basin Geology

From a structural geology standpoint, the La Habra Basin area is dominated by the northwest trending La Habra Syncline (a U–shaped down–fold) which is bounded on the north by the Puente Hills and on the south by the Coyote Hills. The fold is a naturally occurring trough, or valley, where significant quantities of groundwater have accumulated over the past 150,000 years. The La Habra Groundwater Basin consists of four major formations, which include bearing zones or aquifer units. These are the Alluvium, the La Habra Formation, the Coyote Hills Formation, and the San Pedro Formation.

The Alluvium is found along the surface stream courses and is composed of unconsolidated silt, clay, sand, and gravel. Alluvium thickness ranges from a few feet to over 100 feet. The La Habra Formation lies below the Alluvium, but it can be seen where it is uplifted and exposed in both the Coyote Hills and in the Puente Hills. The La Habra Formation consists of mudstone, siltstone, sandstone, and conglomerate. It ranges in thickness from 300 to nearly 1,200 feet. Water levels of wells in the La Habra Formation have been measured between 100 and 200 feet below ground surface across the La Habra Basin area.

Immediately underneath the La Habra Formation lies the Coyote Hills Formation. The Coyote Hills Formation is made up of mudstone interbedded with sandstone and pebbly conglomerate, which are 300 to 1,200 feet thick. Water levels in wells of the Coyote Hills Formation have been measured at about 120 feet below the ground surface.

The deepest water bearing unit is the San Pedro formation. The San Pedro formation is comprised of cemented and non–cemented sands, silty sandstone, sandy conglomerate, and pebbly conglomerates. The San Pedro Formation ranges between 200 and 400 feet in thickness and produces the best quality groundwater of all the water bearing zones. Pressure levels of confined groundwater in wells of the San Pedro aquifer zone range from about 100 to 200 feet below ground surface.

3.3.2. Historical Groundwater Production

Local groundwater accounted for only 54 to 63 AFY (about 1 percent) of the City's total water supply in the past five years as shown in Table 3-6.

Table 3-6: Amount of Groundwater Pumped in the Past 5 Years (AFY)

Basin Name(s)	Fiscal Year Ending				
	2005	2006	2007	2008	2009
La Habra Basin	63	59	54	58	93
% of Total Water Supply	**1%**	**1%**	**1%**	**1%**	**1%**

3.3.3. Projections of Groundwater Production

Local groundwater production from the La Habra Basin is expected to increase to 110 AFY starting in 2015 through to 2035. This assumes production at the well's maximum capacity as shown in Table 3-7.

Table 3-7: Amount of Groundwater Projected to be Pumped (AFY)

Basin Name(s)	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035-opt
La Habra Basin	99	110	110	110	110	110
% of Total Water Supply	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**

3.4. Supply Reliability

3.4.1. Overview

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. The City depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to insure it has adequate supplies. Development of groundwater and desalination opportunities augments the reliability of the imported water system. There are various factors that may impact reliability of supplies such as legal, environmental, water quality and climatic which are discussed below. The water supplies are projected to meet full service demands; Metropolitan's 2010 RUWMP finds that Metropolitan is able to meet with existing supplies, full-service demands of its member agencies starting 2015 through 2035 during normal years, single dry year, and multiple dry years.

Metropolitan's 2010 Integrated Water Resources Plan (IRP) update describes the core water resource strategy that will be used to meet full service demands at the retail level under all foreseeable hydrologic conditions from 2015 through 2035. The foundation of Metropolitan's resource strategy for achieving regional water supply reliability has been to develop and implement water resources programs and activities through its IRP preferred resource mix. This preferred resource mix includes conservation, local resources such as water recycling and groundwater recovery, Colorado River supplies and transfers, SWP supplies and transfers, in-region surface reservoir storage, in-region groundwater storage, out-of-region banking, treatment, conveyance and infrastructure improvements. MWDOC is reliant on Metropolitan for all of its imported water. With the addition of planned supplies under development, Metropolitan's 2010 RUWMP finds that Metropolitan will be able to meet full-service demands from 2015 through 2035, even under a repeat of the worst drought. Table 3-8 shows the reliability of the wholesaler's supply for single dry year and multiple dry year scenarios.

Table 3-8: Wholesaler Supply Reliability - % of Normal AFY

		Multiple Dry Water Years		
Wholesaler Sources	Single Dry	Year 1	Year 2	Year 3
MWDOC	100%	100%	100%	100%

In addition to meeting full-service demands from 2015 through 2035, Metropolitan projects reserve and replenishment supplies to refill system storage. MWDOC's 2010 RUWMP states that it will meet full service demands to its customers from 2015 through 2035. Table 3-9 shows the basis of water year data used to predict drought supply availability.

Table 3-9: Basis of Water Year Data

Water Year Type	Base Year	Base Year	Base Year
Normal Water Year	Average 1922-2004		
Single-Dry Water Year	1977		
Multiple-Dry Water Years	1990	1991	1992

3.4.2. Factors Impacting Reliability

The Act requires a description of the reliability of the water supply and vulnerability to seasonal or climatic shortage. The City relies on import supplies provided by Metropolitan through MWDOC. The following are some of the factors identified by Metropolitan that may have an impact the reliability of Metropolitan supplies.

Environment – Endangered species protection needs in the Sacramento-San Joaquin River Delta have resulted in operational constraints to the SWP system. The Bay-Delta's declining ecosystem caused by agricultural runoff, operation of water pumps and other factors has led to historical restrictions in SWP supply deliveries. SWP delivery restrictions due to the biological opinions resulted in the loss of about one-third of the available SWP supplies in 2008.

Legal – Listings of additional species under the Endangered Species Act and new regulatory requirements could impact SWP operations by requiring additional export reductions, releases of additional water from storage or other operational changes impacting water supply operations. Additionally, the Quantification Settlement Agreement has been challenged in courts and may have impacts on the Imperial Irrigation District and San Diego County Water Authority transfer. If there are negative impacts, San Diego could become more dependent on the Metropolitan supplies.

Water Quality –Water imported from the Colorado River Aqueduct (CRA) contains high level of salts. The operational constraint is that this water needs to be blended with SWP supplies to meet the target salinity of 500 mg/L of total dissolved solids (TDS). Another water quality concern is related to quagga mussel. Controlling the spread and impacts of quagga mussels within the Colorado River Aqueduct require extensive maintenance and results in reduced operational flexibility.

Climate Change – Changing climate patterns are expected to shift precipitation patterns and affect water supply. Unpredictable weather patterns will make water supply planning even more challenging. The areas of concern for California include the reduction in Sierra Nevada snowpack, increased intensity and frequency of extreme weather events, and rising sea levels causing increased risk of levee failure.

Legal, environmental, and water quality issues may have impacts on Metropolitan supplies. It is felt however that climatic factors would have more of an impact than the others. Climatic conditions have been projected based on historical patterns; however severe pattern changes may occur in the future. Table 3-10 shows the factors resulting in inconsistency of supply.

Table 3-10: Factors Resulting in Inconsistency of Supply

Name of Supply	Legal	Environmental	Water Quality	Climatic
State Water Project	X	X		X
Colorado River	X		X	X

These and other factors are addressed in greater detail in Metropolitan's 2010 RUWMP.

3.4.2.1. Water Quality

Imported Water - Metropolitan Water District of Southern California (Metropolitan) is responsible for providing water of a high quality throughout its service area. The water that Metropolitan delivers is tested both for currently regulated contaminants and for additional contaminants of concern as over 300,000 water quality tests are conducted each year to regulate the safety of its waters. Metropolitan's supplies originate primarily from the Colorado River Aqueduct (CRA) and from the State Water Project (SWP). A blend of these two sources, proportional to each year's availability of the source, is then delivered throughout Metropolitan's service area.

Metropolitan's primary sources, face individual water quality issues of concern. The CRA water source contains a higher level of total dissolved solids (TDS) and a lower level of organic material while the SWP contains a lower TDS level while its level or organic materials is much higher, lending to the formation of disinfection byproducts. To remediate the CRA's high level of salinity and the SWP's high level of organic materials, Metropolitan has been blending CRA water with SWP supplies as well as implementing updated treatment processes to decrease the disinfection byproducts. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium VI while also investigating the potential water quality impact of emerging contaminants, N-nitrosodimethylamine (NDMA) and pharmaceuticals and personal care products (PPCPs). Metropolitan has assured its ability

to overcome the above mentioned water quality concerns through its protection of source waters, implementation of renovated treatment processes, and blending of its two sources. While unforeseeable water quality issues could alter reliability, Metropolitan's current strategies ensure the deliverability of high quality water.

Groundwater – The La Habra Groundwater Basin has poor water quality that would require extensive treatment and blending with higher quality water to meet the State's health standards. Therefore, the City owns one groundwater well and is used for irrigation purposes solely.

Table 3-11 shows the impact in acre-feet per year that water quality would have on supply.

Table 3-11: Water Quality – Current and Projected Water Supply Impacts (AFY)

Water Source	Fiscal Year Ending					
	2010	2015	2020	2025	2030	2035-opt
Imported	0	0	0	0	0	0
Local	0	0	0	0	0	0

3.4.3. Normal-Year Reliability Comparison

The City has entitlements and/or written contracts to receive imported water from Metropolitan via the regional distribution system. Although pipeline capacity rights do not guarantee the availability of water, per se, they do guarantee the ability to convey water when it is available to the Metropolitan distribution system. All imported water supplies assumed in this section are available to the City from existing water transmission facilities. Table 3-12 shows supply and demand under normal year conditions. Water supplies are projected to be available from Metropolitan; however, it is not included here since projected supplies meet projected demands.

Table 3-12: Projected Normal Water Supply and Demand (AFY)

	Fiscal Year Ending				
	2015	2020	2025	2030	2035
Total Demand	**10,539**	**10,941**	**11,249**	**11,350**	**11,463**
La Habra Basin	110	110	110	110	110
Cal Domestic	8,000	8,000	8,000	8,000	8,000
Imported	2,429	2,831	3,139	3,240	3,353
Total Supply	10,539	10,941	11,249	11,350	11,463

3.4.4. Single Dry-Year Reliability Comparison

The City has documented that it is 100% reliable for single dry year demands from 2015 through 2035 with a demand increase of 8.6% using FY 2001-02 as the single dry year. Table 3-13 compiles supply and demand projections for a single dry water year. The available imported supply is greater than shown; however, it is not included because all demands are met.

Table 3-13: Projected Single-Dry Year Water Supply and Demand (AFY)

	Fiscal Year Ending				
	2015	**2020**	**2025**	**2030**	**2035**
Total Demand	**11,445**	**11,882**	**12,216**	**12,326**	**12,449**
La Habra Basin	110	110	110	110	110
Cal Domestic	8,000	8,000	8,000	8,000	8,000
Imported	3,335	3,772	4,106	4,216	4,339
Total Supply	11,445	11,882	12,216	12,326	12,449

3.4.5. Multiple Dry-Year Reliability Comparison

The City is capable of providing their customers all their demands with significant reserves in multiple dry years from 2015 through 2035 with a demand increase of 5.6% using FY 2003-04 as the multiple dry years. This is true even if the demand projections were to be increased by a large margin. Table 3-14 shows supply and demand projections under multiple dry year conditions.

Table 3-14: Projected Multiple Dry Year Period Supply and Demand (AFY)

		Fiscal Year Ending				
		2015	**2020**	**2025**	**2030**	**2035**
First Year Supply	**Total Demand**	**11,445**	**11,882**	**12,216**	**12,326**	**12,449**
	La Habra Basin	110	110	110	110	110
	Cal Domestic	8,000	8,000	8,000	8,000	8,000
	Imported	3,335	3,772	4,106	4,216	4,339
	Total Supply	11,445	11,882	12,216	12,326	12,449
Second Year Supply	**Total Demand**	**11,445**	**11,882**	**12,216**	**12,326**	**12,449**
	La Habra Basin	110	110	110	110	110
	Cal Domestic	8,000	8,000	8,000	8,000	8,000
	Imported	3,335	3,772	4,106	4,216	4,339
	Total Supply	11,445	11,882	12,216	12,326	12,449
Third Year Supply	**Total Demand**	**11,445**	**11,882**	**12,216**	**12,326**	**12,449**
	La Habra Basin	110	110	110	110	110
	Cal Domestic	8,000	8,000	8,000	8,000	8,000
	Imported	3,335	3,772	4,106	4,216	4,339
	Total Supply	11,445	11,882	12,216	12,326	12,449

4. Demand Management Measures

4.1. Overview

Water conservation, often called demand-side management, can be defined as practices, techniques, and technologies that improve the efficiency of water use. Such practices are referred to as demand management measures (DMM). Increased efficiency expands the use of the water resource, freeing up water supplies for other uses, such as population growth, new industry, and environmental conservation.

The increasing efforts in water conservation are spurred by a number of factors: growing competition for limited supplies, increasing costs and difficulties in developing new supplies, optimization of existing facilities, delay of capital investments in capacity expansion, and growing public support for the conservation of limited natural resources and adequate water supplies to preserve environmental integrity.

The City recognizes the importance of water conservation and has made water use efficiency an integral part of water use planning. The City is not a CUWCC signatory however; it is currently implementing all 14 DMMs described in the Act. DMMs as defined by the Act correspond to the CUWCC's Best Management Practices (BMPs).

This section of the UWMP satisfies the requirements of § 10631 (f) & (j). It describes how each DMM is being implemented by the City and how the City evaluates the effectiveness of the DMMs implemented. This section also provides an estimate of existing conservation savings where information is available.

4.2. Water Use Efficiency Programs

The City has implemented and is actively participating in many water conservation activities. The City sets aside a budget of $102,000 per year for water conservation programs. The City's Water Conservation and Water Supply Shortage Program Ordinance was revised and adopted by the City Council in June 2009 as Ordinance No. 1123.

Moreover, as a member agency of MWDOC, the City actively participates in various Metropolitan residential and CII rebate programs, as well as school and public education and outreach programs, and other programs administered by MWDOC. MWDOC implements many of the urban water conservation BMPs on behalf of its member agencies. MWDOC's 2010 Regional UWMP should be referred to for a detailed discussion of each regional BMP program. The City works cooperatively with MWDOC

for technical and financial support needed to implement the DMMs. MWDOC's current Water Use Efficiency Program, detailed in their 2010 Regional UWMP, implemented on behalf of its member agencies following three basic focuses:

1. Regional Program Development – MWDOC develops, obtains funding for, and implements regional BMP programs on behalf of all retail water agencies in Orange County.
2. Local Program Assistance - MWDOC assists retail agencies to develop and implement local programs within their individual service areas.
3. Research and Evaluation – MWDOC conducts research programs which allow an agency to measure the water savings benefits of a specific program and then compare those benefits to the costs of implementing the program in order to evaluate the economic feasibility of the program.

Table 4-1 provides an overview of City's DMM program status.

Table 4-1: Urban Supplier's Demand Management Measures Overview

Demand Management Measure (DMM)	DMM Status		
	Past	Current	Future
Residential Water Surveys		X	
Residential Plumbing Retrofits		X	
System Water Audits, Leak Detection and Repair		X	
Metering with Commodity Rates		X	
Large Landscape Conservation Programs		X	
High-Efficiency Washing Machine Rebates		X	
Public Information Programs		X	
School Education Programs		X	
Commercial, Industrial and Institutional Programs		X	
Wholesale Agency Assistance		N/A	
Conservation Pricing		X	
Conservation Coordinator		X	
Water Waste Prohibition		X	
Residential ULFT Replacement Programs	X		

4.2.1. DMM 1: Water Survey Programs for Single-Family Residential and Multi-Family Residential Customers

Residential Survey Program - Each month when the meters are read, the City's Finance Department is alerted by the billing system of all of the high use accounts. At that time,

the Finance Department contacts the customer and sets up a leak survey. The Water Division then sends out a representative to see if the customer has a leak. If there is a leak, the City representative helps the customer locate it. If there is no leak, the City representative checks sprinkler run times and educates the customer on irrigation. Toilets are also checked to see if leaks exist. If leaks are detected, they are fixed immediately. As part of the survey, customers are given water conservation pamphlets and low flow shower heads and new flappers for toilets.

In addition to the residential survey program, the City participates in various MWDOC programs aimed at increasing landscape water use efficiency for residential customers. These regional landscape programs are explained below.

Smart Timer Rebate Program - The Smart Timer Rebate Program started in FY 2004/05. Under this regional program, residential and small commercial properties are eligible for a rebate when they purchase and install a weather-based irrigation controller which has the potential to save 41 gallons per day per residence and reduce runoff and pollution by 49%. Once residents are enrolled in the rebate program, a detailed residential outdoor water survey is conducted to inspect the irrigation system, distribution uniformity, and irrigated area. Water savings from the program can be estimated from information obtained from the water surveys pre- and post-installation of the Smart Timer. As of FY 2010-11, 14 rebates have been given out to residential customers and 58 rebates to small commercial customers which translate to a water savings of approximately 141 acre-feet. The City will continue to provide on-site meetings, literature and incentives related to this program. As part of the MWDOC Grant for the SmarTimers, a site audit and inspection is required and provided by contract through MWDOC.

Rotating Nozzle Rebate Program – This rebate program started in 2007 and is offered to both residential and commercial customers. Through this program, site owners will purchase and install rotary nozzles in existing irrigation systems. Following the submittal of a rebate application, water bill, and original purchase receipt, MWDOC will direct a third party installation verification contractor to perform installation verifications on up to 100% of the sites that installed devices. As of FY 2010-11 the total rotating nozzle program participation includes 30 residential and 100 small commercial customers representing a water savings of 1.1 acre-feet, collectively, since the beginning of the program.

Synthetic Turf Rebate Program – Through this program, residential and small commercial customers of participating retail water agencies are eligible to receive rebate money for qualifying synthetic turf projects. To date 2,653 sq. ft. of turf grass have been replaced by synthetic turf on residential properties and another 2,160 sq. ft. on commercial properties translating to a combined savings 1.95 acre-feet since the beginning of the program.

4.2.2. DMM 2: Residential Plumbing Retrofit

The City participated in Metropolitan's showerhead distribution program which began in 1991. To determine whether the 75% saturation requirement was achieved within Orange County, the *Orange County Saturation Study* was conducted by MWDOC and Metropolitan in 2001. Data was obtained through telephone surveys and on-site inspections. Using the saturation findings of the study, MWDOC estimates that today low flow showerhead saturation is at nearly 100% for single-family homes and at 94% for multi-family homes. As a result, MWDOC and the City do not have plans for any future showerhead distributions.

Additionally, the City participated in MWDOC's regional ultra low flow toilet (ULFT) rebate program. A total of 3,720 ULFTs were distributed under this program to single-family and multi-family homes in the City's service area representing a cumulative water savings of 1,446 acre-feet. The ULFT program ended in 2009 and was replaced by the high efficiency toilets (HETs) rebate program. HETs are toilets which use 1.28 gallons per flush or less. The ULFT and HET rebate programs are discussed in more detail under DMM 14 in Section 4.2.14.

4.2.3. DMM 3: System Water Audits, Leak Detection and Repair

The City has been implementing a water audit program for more than 20 years. The City performs water audits for various customers weekly. The City also performs audits on its own facilities twice annually. Table 4-2 summarizes the City's actual main and lines replacement activities in the past five years as well as the activities planned for the next five years.

Table 4-2: System Water Audits, Leak Detection and Repair DMM

Actual	2006	2007	2008	2009	2010
% of Unaccounted Water	<10%	<10%	<10%	<10%	<10%
Miles of Mains Surveyed	N/A	N/A	N/A	N/A	16.8
Miles of Lines Replaced	1.86	0.20	0.98	0.10	0.4
Actual Expenditures ($)	685,761	67,971	289,520	29,813	800,000
Actual Water Savings (AFY)	3	0	1	0.5	1.5

Planned	2011	2012	2013	2014	2015
% of Unaccounted Water	<10%	<10%	<10%	<10%	<10%
Miles of Mains Surveyed	N/A	N/A	N/A	N/A	N/A
Miles of Lines Replaced	1.7	0.8	0.7	1.0	1.5
Planned Expenditures ($)	1,600,000	960,000	820,000	845,000	1,400,000
Planned Water Savings (AFY)	2	0 .75	1	1	0.5

In an effort to assist retail agencies, MWDOC publishes annually the Orange county Water Agencies Water Rates, Water System Operations, and Financial Information survey. This survey facilitates a pre-screening survey that estimates the volume and percent of non-revenue water for each retail water agency in Orange County. In 2009, the percent of non-revenue water for the City of Brea was 3%.

The City has not developed a formal methodology to estimate the water savings attributable to this DMM. There are, however, real water savings as a result of the proactive pre-screening leak detections and repair program which maintains an acceptable non-revenue water.

4.2.4. DMM 4: Metering with Commodity Rates

Metering with commodity rates by wholesale and retail agencies has been an industry standard throughout Orange County including the City for many years. All of the City's customers are metered and billed based on commodity rates on a monthly basis. The City employs an inclining block rate structure for residential service as discussed in Section 4.2.11 below. The City has not developed a formal methodology to estimate the water savings attributable to this DMM. Therefore, at this time, there is no formal evaluation to determine the efficacy of this DMM.

4.2.5. DMM 5: Large Landscape Conservation Programs and Incentives

The City has adopted DWR State Model Landscaping Ordinance by reference and has incorporated it as part of its Water Conservation Ordinance No. 1123 in accordance with AB 1881.

The City collaborates with Metropolitan and MWDOC on several large landscape water use efficiency programs. Many of Metropolitan and MWDOC's landscape water use efficiency programs target both residential and commercial customers as described under DMM 1. Programs which specifically assist large landscape customers are summarized below:

Save Water Save A Buck Rebate Program – As a member agency of MWDOC, the City takes part in Metropolitan's Save Water Save a Buck Rebate Program which offers financial incentives to CII customers who purchase approved weather-based irrigation controllers (smart timers), Central Computer Irrigation Controller, rotating nozzles for pop-up spray head retrofits, and large rotary nozzles.

Water savings achieved through this program is tracked by MWDOC. As of FY 2010-11 the total rotating nozzle program participation includes 100 small commercial customers (and 30 residential customers) representing 1.1 acre-feet of savings, collectively. A total of 58 smart timers rebates to have been given out commercial customers and 14 smart timer rebates to residential customers translating to 141 acre-feet of savings, collectively.

Landscape Performance Certification Program (LPCP) – This is a MWDOC-administered program which started in 2004. The LPCP program is a free water management training program sponsored by MWDOC and Metropolitan and offered to CII customers with dedicated irrigation meters. The program also helps create site specific water budgets and track monthly water use for each participating site.

California Friendly Landscape Training (Professional) – The California Friendly Landscape Training provides education to residential homeowners and professional landscape contractors on a variety of landscape water efficiency practices they can employ. These classes are hosted by MWDOC and/or the member agencies to encourage participation across the county. The Professional Training Program course consists of four consecutive classes in landscape water management, each building upon principles presented in the preceding class. Each participant receives a bound handbook containing educational materials for each class. These classes are offered throughout the year and taught in both English and Spanish languages.

In addition, the City takes advantage of regional and local efforts which target and market to large landscape properties including bill inserts and direct marketing efforts.

4.2.6. DMM 6: High-Efficiency Washing Machine Rebate Programs

The City participates in the SoCal Water Smart residential rebate program offered by Metropolitan. This program offers financial incentives to single-family and multifamily residential customers through the form of a rebate. Orange County residents were eligible to receive an $85 rebate with the purchase of a new High Efficiency Clothes Washer (HECW). This program began in 2001 and sponsored by Metropolitan. Rebates are available on a first-come, first-served basis, while funds last. Metropolitan recently ended this program in 2011. Applications must have been postmarked by December 6, 2010 to qualify for a rebate. Participants must be willing to allow an inspection of the installed machine for verification of program compliance. To qualify for a rebate, the must have a water factor of 4.0 or less. Depending on use, these machines can save 10,000 gallons of

water per year Participants are encouraged to contact their local gas and/or electric utility as additional rebates may be available. As of FY 2010-11, the City has given out 1,105 high-efficiency washing machine rebates to its customers. This equates to a water savings of 135 acre-feet.

4.2.7. DMM 7: Public Information Programs

MWDOC implements various water use efficiency public information programs on behalf of its member agencies. MWDOC's public information programs are built around communication, coordination and partnerships with its member agencies and cities, Metropolitan, and other local, state, and federal legislative and regulatory bodies. MWDOC's information programs are carried out on behalf of and in coordination with its member agencies. The goal is to help the member agencies and public understand current issues and the challenges, opportunities and costs involved in securing a reliable supply of high quality water. Through a variety of public information programs, MWDOC assists its member agencies in reaching the public with accurate information regarding present and future water supplies, the demands for a suitable quantity and quality of water, and the importance of implementing water efficient techniques and behaviors. MWDOC also assists its member agencies in publicizing the availability of water use efficiency programs and technologies throughout Orange County. Current regional public information programs within the MWDOC's service area are summarized below. There is no method to evaluate the water savings attributable to this DMM, however, the City will continue to administer this DMM for its ability to educate and interact with customers.

Water Facility Inspection Trip Program **-** The inspection trip program is sponsored by MWDOC and Metropolitan. Each year, Orange County elected officials, residents, business owners, and community leaders are invited to attend educational inspection trips to tour key water facilities throughout the state of California. The goal is to educate members of our community about planning, procurement and management of southern California's water supply and the issues surrounding delivery and management of this vital resource.

O.C. Water Hero Program - The goal of this program is to engage children in water use efficiency activities while facilitating discussion with friends and family members about how to save water. Any Orange County child can become a Water Hero by pledging to save 20 gallons of water per day. In exchange for their pledge, they receive a free Water Hero kit, which includes a variety of fun, water-saving items like a 5-minute shower timer and "fix-it" ticket pad for busting water wasters. To become a Superhero, a student must get their parents to also pledge to save 20 gallons of water per day. To date, more than 13,000 children in Orange County have become Water Heroes and more than 4,000 have become Superheroes.

***eCurrents* -** This monthly electronic newsletter is designed to keep Orange county water agencies, residents and businesses, stakeholder groups, opinion leaders, and others apprised of MWDOC news, programs, events, and activities. The publication also serves to keep readers informed about regional, state, and federal issues affecting water supply, water management, water quality, and water policy and regulation.

***Water Advisory Committee of Orange County (WACO)* -** WACO was formed in 1983 to facilitate the introduction, discussion, and debate of current and emerging water issues among Orange County policymakers and water professionals. The committee's membership has evolved to include elected officials and management staff from Orange County cities and water districts, engineers, attorneys, consultants, and other industry professionals. Monthly meetings are open to the public and are typically held on the first Friday of each month at 7:30 a.m.

4.2.8. DMM 8: School Education Programs

MWDOC implements various water education programs on behalf of its member agencies. School water education has been part of MWDOC's activities for more than 30 years. It is MWDOC's goal to educate children about local water issues and help them understand the value of water and how they can protect our water resources and the environment. MWDOC's on-going school education programs are described below. While it is not feasible for the City to evaluate the water savings of this DMM, the City will continue to consider this DMM as vital and necessary.

***Water Education School Program* -** One of the most successful and well-recognized water education curriculums in southern California is MWDOC's Water Education School Program. For more than 30 years, School Program mascot "Ricki the Rambunctious Raindrop" has been educating students in grades K-5 about the water cycle, the importance and value of water, and the personal responsibility we all have as environmental stewards.

The School Program features assembly-style presentations that are grade-specific and performed on-site at the schools. The program curriculum is aligned with the science content standards established by the State of California. Since its inception in 1973, nearly three million Orange County students have been educated through the School Program.

In 2004, MWDOC formed an exciting partnership with Discovery Science Center that has allowed both organizations to reach more Orange County students each year and provide them with even greater educational experiences in the areas of water and science. Discovery Science Center currently serves as the School Program administrator, handling

all of the program marketing, bookings, and program implementation. During the 2010-11 school year, more than 70,000 students will be educated through the program.

Water Education Poster & Slogan Contest - Each year, MWDOC holds a Water Education Poster and Slogan Contest to increase water awareness. To participate, children in grades K-6 develop posters and slogans that reflect a water awareness message. The goal is to get children thinking about how they can use water wisely and to facilitate discussion about water between children and their friend, parents, and teachers. Each year, more than 1,500 poster and slogan entries are received through the contest.

During a special judging event, approximately 16 posters and 10 slogans are selected as the winners. All of our winners – and their parents, teachers, and principals – are invited to attend a special awards ceremony with Ricki Raindrop at Discovery Science Center. At the awards ceremony, the winners are presented with their framed artwork as well as a custom t-shirt featuring their poster or slogan, a trophy, a certificate, and other fun water-saving prizes.

Children's Water Education Festival - The largest water education festival of its kind is the annual Children's Water Education Festival (Festival). The Festival is presented by OCWD, the National Water Research Institute, Disneyland Resort, and MWDOC. Each year, more than 5,000 students participate in the Festival over the course of this two-day event. The Festival is currently held at the Richard Nixon Library and Birthplace in Yorba Linda, California.

The Festival presents a unique opportunity to educate students in grades four through six about local water issues and help them understand how they can protect our water resources and the environment. Students attend the Festival with their teacher and classmates, visiting a variety of booths focused on different water-related topics throughout the day. Participating organizations (presenters) engage the students through interactive educational presentations that are aligned with the science content standards established by the State of California. Since its inception, more than 80,000 children from schools throughout Orange County have experienced the Festival and all it has to offer.

4.2.9. DMM 9: Conservation Programs for Commercial, Industrial and Institutional Accounts

The City offers financial incentives through Metropolitan's Save Water Save A Buck Rebate Program which offers rebates for various water efficient devices to CII customers. The City also participates in MWDOC's Water Smart Hotel Program as described below.

Save Water Save a Buck – This program began in 2002 and offers rebates to assist commercial, industrial, and institutional customers in replacing high-flow plumbing fixtures with low-flow fixtures. Facilities where low-flow devices are installed must be

located in Orange County. Rebates are available only on those devices listed in Table 4-3 below and must replace higher water use devices. Installation of devices is the responsibility of each participant. Participants may purchase and install as many of the water saving devices as is applicable to their site.

Table 4-3: Retrofit Devices and Rebate Amounts Available Under Save Water Save a Buck Program

Retrofit Device	Rebate Amount
High Efficiency Toilet	$50
Ultra-Low-Water or Zero Water Urinal	$200
Connectionless Food Steamers	$485 per compartment
Air-Cooled Ice Machines (Tier III)	$300
Cooling Tower Conductivity Controller	$625
pH / Conductivity Controller	$1,750
Dry Vacuum Pumps	$125 per HP
Water Pressurized Broom	$110

As of FY 2010/11, the City's CII customers have installed a total of 291 water-saving fixtures representing a water savings of 159 acre-feet.

Water Smart Hotel Program – In 2008 and 2009, MWDOC received grants from DWR and the US Bureau of Reclamation (USBR) to conduct the Water Smart Hotel Program, a program designed to provide Orange County hotels and motels with commercial and landscape water saving surveys, incentives for retrofits and customer follow-up and support. The goal of the program is to implement water use efficiency changes in hotels to achieve an anticipated water savings of 7,078 acre feet over 10 years.

The Program is offered to hotels in MWDOC's service area as identified by retail water agencies. It is anticipated that detailed survey of the indoor and outdoor water using aspects of up to 105 participating hotels will be performed. Participating hotels will receive survey reports that recommend indoor and outdoor retrofits, upgrades, and other changes that should, based on the survey, result in significant water savings. Quantities of each device and associated fixture and installation costs, water savings and payback information (based on rebate amount Incentives offered through the Save Water Save A Buck Rebate Program will be augmented using DWR and USBR Water Use Efficiency grant funds to bridge the gap between existing incentives and the actual costs of Hotel Water Survey recommendations. To date, over 24 surveys have been performed county-

wide, and over 9,500 water-saving devices have been installed through the program. These devices are saving 351 acre feet per year or 3,510 acre feet over the ten year device life.

4.2.10. DMM 10: Wholesale Agency Programs

This DMM pertains to wholesale agency programs which are not applicable to the City, a retail supplier. The City is a member agency of MWDOC, the region's wholesaler that is responsible for the implementation and reporting requirements of this DMM.

4.2.11. DMM 11: Conservation Pricing

The City currently employs a four-tier inclining block rate structure for residential customers and a uniform rate for non-residential customers (Table 4-4). This rate structure recently became effective on January 1, 2011.

Table 4-4: Brea's Current Water Rates ($ per unit)

Units and Rates	Single Family Residential	Lifeline	Non-residential
1-12 Units	$2.43	$1.95	$2.63
13-24 Units	$2.91	$2.33	
25-36 Units	$3.21	$3.21	
>37 Units	$3.53	$3.53	

1 unit = 100 cubic feet

The City has not conducted an evaluation of the water savings attributable to this DMM, however, the City will continue to make customers aware of the rate structure and use it as a tool to affect water conservation.

4.2.12. DMM 12: Water Conservation Coordinator

The City has maintained a full-time position of conservation coordinator since 2009 and is planning to hire an additional full-time water conservation coordinator in 2011 to provide support as necessary. The water conservation coordinator is responsible for coordinating all conservation program activities and acts as a liaison with MWDOC, Metropolitan, CUWCC, and other stakeholders. Duties of the City's water conservation coordinator is summarized below:

- Revise the Water Conservation program as new technologies and program elements are identified.
- Assure ongoing management of program components such as the California Irrigation Management Information System (CIMIS) weather stations, ULFTs and

other water-saving devices, water-conserving landscaping and irrigation techniques, rebate measures, recycled water uses, CII/residential water use surveys, ongoing public awareness campaign and consumer education.

- Participate with MWDOC in the K-12 Water Awareness Program.
- Gather, analyze, and interpret data related to water supply and use to determine cost effective program options.
- Coordinate the water conservation program efforts of various City departments and volunteer groups; represent the City in dealing with water conservation issues before the City Council, apartment house owners, state and local regulators, and a wide range of community groups.
- Attend all water use efficiency meetings at MWDOC.
- Present workshops and short training programs on conservation topics; develop strategies and time schedule for implementing program components.
- Operate water conservation computer programs, spreadsheets and databases.
- Develop activities for observance of State Water Awareness Month.
- Write technical reports and proposed regulations and ordinances to control the use of water. Write and administer grants for water conservation projects.
- Update Brea's Urban Water Management and Urban Water Shortage Contingency Plans.
- Manage contracts for services and oversee procurement of conservation materials.
- Track, implement, and maintain compliance of Best Management Practices (BMP).
- Request other options for conservation goals when BMP is not cost effective or compliance is jeopardized.
- Other duties include conducting water audits; may install or provide advice in installing water-saving devices; coordinate with other agencies in the planning and implementation of regional conservation programs.
- Identify high-volume users, help them to set up a water auditing program, and monitor and evaluate results; create press releases, newsletters, flyers and other information resources on water conservation.

4.2.13. DMM 13: Water Waste Prohibition

Ordinance No. 1123 adopted in 2009 revised the City's Water Conservation and Water Supply Shortage Program. The ordinance establishes permanent water conservation standards intended to alter behavior related to water use efficiency for non-shortage conditions including:

1. Limits on watering hours
2. Limits on water duration
3. No excessive water flow or runoff
4. No washing down hard or paved surfaces

5. Obligation to fix leaks, breaks, or malfunctions
6. Re-circulating water required for water fountains and decorative water features
7. Limits on washing vehicles
8. Drinking water served upon request only
9. Commercial lodging establishments must provide option to note launder linen daily
10. No installation of single pass cooling systems
11. No installation of non-re-circulating water systems in commercial car wash and laundry systems
12. Restaurant required to use water conserving dish wash spray valves

The ordinance also establishes three phases of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies. This is further discussed in Section 5.

Table 4-5 summarizes the City's water waste prohibition efforts in the past five years and the projected number of site visits and expenditures related to regulating Ordinance No. 1123.

Table 4-5: Water Waste Prohibition

Actual	2006	2007	2008	2009	2010
Waste Ordinance in Effect	Y	Y	Y	Y	Y
# of On-Site Visits	221	201	151	206	216
Water Softener Ordinance	N	N	N	N	N
Actual Expenditures ($)	$13,260	$12,060	$9,060	$12,360	$12,960

Planned	2011	2012	2013	2014	2015
Waste Ordinance in Effect	Y	Y	Y	Y	Y
# of On-Site Visits	210	210	210	210	210
Water Softener Ordinance	N	N	N	N	N
Planned Expenditures ($)	$15,750	$15,750	$15,750	$15,750	$15,750

The City has not conducted an evaluation of the water savings attributable to this DMM.

4.2.14. DMM 14: Residential Ultra-Low-Flush Toilet Replacement Programs

Over the past 19 years, the City has continuously implemented a regional ULFT Rebate and/or Distribution Program targeting single- and multi-family homes in Orange County. Since the end of distribution program in 2004, MWDOC's program has focused solely on providing rebate incentives for retrofitting non-efficient devices with either ULFTs or High Efficiency Toilets (HETS) – toilets using 1.28 gallons per flush or less. The ULFT portion of this program concluded in June 2009, and over 360,000 ULFTs were replaced in single family and multi-family homes, with an overall program to date savings of approximately 138,457 acre feet of water. The HET rebate program, which concluded in 2010, has incentivized over 26,000 devices, with an overall program to date savings of approximately 3,419 acre-feet.

The City has participated in this program from the beginning. To date 3,720 ULFTs and 108 HETs have been installed representing a combined water savings of 1,457 acre-feet.

5. Water Supplies Contingency Plan

5.1. Overview

Recent water supply challenges throughout the American Southwest and the State of California have resulted in the development of a number of policy actions that water agencies would implement in the event of a water shortage. In southern California, the development of such policies has occurred at both the wholesale and retail level. This section describes how new and existing policies that Metropolitan, MWDOC and the City have in place to respond to water supply shortages, including a catastrophic interruption and up to a 50 percent reduction in water supply.

5.2. Shortage Actions

Metropolitan

As an importer of water from multiple sources, including both the Colorado River and Sierra Nevada, a number of water supply challenges have impacted the reliability of Metropolitan's imported supplies. In response to these challenges, Metropolitan has implemented existing policies as well as developed new ones.

The first action that Metropolitan implements in the event of a water shortage is the suspension and/or reduction of its interruptible supplies, which are supplies sold at a discount in return for the buyers agreeing to be the first to be cutback in the event of a shortage. Metropolitan currently has two interruptible programs for agricultural users and groundwater replenishment, under which supplies were either suspended or reduced in 2007.

In addition, in preparation for the possibility of being unable to the meet "firm demands" (non-interruptible supplies) of its member agencies, in February 2008, the Metropolitan's Board of Directors (Board) adopted the Water Supply Allocation Plan (WSAP), which was subsequently updated in June 2009.

Metropolitan's plan includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation. Metropolitan's WSAP is the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and is part of Metropolitan's 2010 RUWMP.

Metropolitan's WSAP was developed in consideration of the principles and guidelines described in Metropolitan's 1999 Water Surplus and Drought Management Plan

(WSDM), with the objective of creating an equitable needs-based allocation. The plan's formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account: impact on retail customers and the economy; growth and population; changes in supply conditions; investments in local resources; demand hardening aspects of non-potable recycled water use; implementation of conservation savings program; participation in Metropolitan's interruptible programs; and investments in facilities.

The formula is calculated in three steps: based period calculations, allocation year calculations, and supply allocation calculations. The first two steps involve standard computations, while the third section contains specific methodology developed for the WSAP.

Step 1: Base Period Calculations – The first step in calculating a water supply allocation is to estimate water supply and demand using a historical based period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the three most recent non-shortage years, 2004-2006.

Step 2: Allocation Year Calculations – The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population or economic growth and changes in local supplies.

Step 3: Supply Allocation Calculations – The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. Each element and its application in the allocation formula are discussed in detail in Metropolitan's WSAP.

In order to implement the WSAP, the Metropolitan Board makes a determination on the level of the regional shortage, based on specific criteria, in April each year. If it is determined allocations are necessary, they go into effect in July for that year and remain for a 12-month period, although the schedule is at the discretion of Metropolitan's Board.

Metropolitan's 2010 RUWMP forecasts that Metropolitan will be able to meet projected firm demands throughout the forecast period from 2015 to 2035. However, these projections do not mean that Metropolitan would not implement its WSAP during this period.

MWDOC

To prepare for the potential allocation of imported water supplies from Metropolitan, MWDOC worked collaboratively with its 28 client agencies to develop its own Water Supply Allocation Plan (MWDOC WSAP), adopted January 2009, to allocate imported water supplies at the retail level. The MWDOC WSAP lays out the essential components of how MWDOC will determine and implement each client agency's allocation during a time of shortage.

The MWDOC WSAP uses a similar method and approach, when reasonable, as that of the Metropolitan's WSAP. However, MWDOC's plan remains flexible to use an alternative approach when Metropolitan's method produces a significant unintended result for the client agencies. The MWDOC WSAP model follows five (5) basic steps to determine a retail agency's imported supply allocation.

Step 1: Determine Baseline Information – The first step in calculating a water supply allocation is to estimate water supply and demand using a historical based period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the last three non-shortage years – calendar years, 2004, 2005, and 2006.

Step 2: Establish Allocation Year Information – In this step, the model adjusts for each member agency's water need in the allocation year. This is done by adjusting the base period estimates for increased retail water demand based on growth and changes in local supplies.

Step 3: Calculate Initial Minimum Allocation Based on Metropolitan's Declared Shortage Level – This step sets the initial water supply allocation for each client agency. After a regional shortage level is established, MWDOC will calculate the initial allocation as a percentage of adjusted Base Period Imported water needs within the model for each client agency.

Step 4: Apply Allocation Adjustments and Credits in the Areas of Retail Impacts, Conservation, and the Interim Agriculture Water Program – In this step, the model assigns additional water to address disparate impacts at the retail level caused by an across-the-board cut of imported supplies. It also applies a conservation credit given to those agencies that have achieved additional water savings at the retail level as a result of successful implementation of water conservation devices, programs and rate structures.

Step 5: Sum Total Allocations and Determine Retail Reliability – This is the final step in calculating a retail agency's total allocation for imported supplies. The model sums an agency's total imported allocation with all of the adjustments and credits and then calculates each agency's retail reliability compared to its Allocation Year Retail Demand.

The MWDOC WSAP includes additional measures for plan implementation, including the following:

- Appeal Process – An appeals process to provide client agencies the opportunity to request a change to their allocation based on new or corrected information. MWDOC anticipates that under most circumstances, a client agency's appeal will be the basis for an appeal to Metropolitan by MWDOC.
- Melded Penalty Rate Structure – At the end of the allocation year, MWDOC would only charge a penalty to each client agency that exceeded their allocation if MWDOC exceeds its total allocation and is required to pay a penalty to Metropolitan. Metropolitan enforces allocations to member agencies through a tiered penalty rate structure: penalty rates to a member agency that exceeds its total annual allocation at the end of the twelve-month allocation period, according to a specified rate structure. MWDOC's penalty would be assessed according to the client agency's prorated share (acre-feet over usage) of MWDOC penalty amount with Metropolitan. Penalty funds collected by Metropolitan will be invested in water conservation and local resource development.
- Tracking and Reporting Water Usage – MWDOC will provide each client agency with water use monthly reports that will compare each client agency's current cumulative retail usage to their allocation baseline. MWDOC will also provide quarterly reports on it cumulative retail usage versus its allocation baseline.
- Timeline and Option to Revisit the Plan – The allocation period will cover 12 consecutive months and the Regional Shortage Level will be set for the entire allocation period. MWDOC only anticipates calling for allocation when Metropolitan declares a shortage; and no later than 30 days from Metropolitan's declaration will MWDOC announce allocation to its client agencies.

Due to the complexity of calculating allocations and the potential for unforeseen circumstances that may occur during an allocation year, after one year of implementation, MWDOC staff and client agencies have the opportunity to make recommendations to the MWDOC Board that will improve the method, calculation, and approach of the MWDOC WSAP.

City of Brea

The City adopted the stages and reduction goals that are triggered by Metropolitan and MWDOC, taking action to implement a rationing stage under the 1995 IICP.

The priorities for use of available potable water during shortages are based on input from Metropolitan, MWDOC and legal requirements set forth in the California Water Code, Sections 350358. Water allocations are established for all customers according to the following system:

- Minimum health and safety allocations for interior residential needs (include single family, multifamily, hospitals and convalescent facilities, retirement and mobile home communities, student housing, fire fighting and public safety).
- Institutional/governmental operations (where water is used for manufacturing and for minimum health and allocations for employees and visitors), to maintain jobs and economic base of the community (not for landscape uses).
- New customers, proposed projects without permits.

As a water purveyor, the City has a commitment to provide the minimum health and safety water needs for its customers at all times. The water shortage response is designed to provide a minimum of 50% of normal supply during a severe or extended water shortage. The rationing program triggering levels were established to ensure that goal is met. The rationing stages may be triggered by a supply shortage or by contamination in sources.

The City has established allocation method for each customer type. Each customer shall be notified of its classification and allotment by mail before the effective date of the Water Shortage Emergency. New customers will be notified at the time the application for service is made. During a disaster, prior notice of allotment may not be possible, notice will be provided by other means.

The City Council adopted Water Conservation and Water Supply Shortage Program Ordinance No. 1123 on June 6, 2009, which establishes a comprehensive staged conservation program that will encourage reduced water consumption within the City through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the City. Along with permanent water conservation requirements, the City's Water Conservation Program consists of the following four stages found in Table 5-1 to respond to a reduction in potable water available to the City for distribution to its customers with year round requirements in effect at all times unless a mandatory conservation stage has been implemented by the City Council.

Table 5-1: Water Supply Shortage Stages and Conditions – Rationing Stages

Stage No.	Water Supply Conditions	% Shortage
Phase 1 Water Supply Shortage	Due to drought or other supply reductions, a consumer demand reduction of up to 10% is necessary to make more efficient use of water and respond to existing conditions.	0-10%
Phase 2 Water Supply Shortage	Due to drought or other supply reductions, a consumer demand reduction of up to 20% is necessary to make more efficient use of water and respond to existing conditions.	0-20%
Phase 3 Water Supply Shortage	The City declares a water shortage emergency condition pursuant to California Water Code Section 350.	0-30%
Phase 4 Water Shortage	The City declares a water shortage emergency condition pursuant to California Water Code Section 350.	Up to 40% or more.

5.3. Three-Year Minimum Water Supply

As a matter of practice, Metropolitan does not provide annual estimates of the minimum supplies available to its member agencies. As such, Metropolitan member agencies must develop their own estimates for the purposes of meeting the requirements of the Act.

Section 135 of the Metropolitan Water District Act declares that a member agency has the right to invoke its "preferential right" to water, which grants each member agency a preferential right to purchase a percentage of Metropolitan's available supplies based on specified, cumulative financial contributions to Metropolitan. Each year, Metropolitan calculates and distributes each member agency's percentage of preferential rights. However, since Metropolitan's creation in 1927, no member agency has ever invoked these rights as a means of acquiring limited supplies from Metropolitan.

As an alternative to preferential rights, Metropolitan adopted the Water Shortage Allocation Plan (WSAP) in February 2008. Under the WSAP, member agencies are allowed to purchase a specified level of supplies without the imposition of penalty rates. The WSAP uses a combination of estimated total retail demands and historical local supply production within the member agency service area to estimate the firm demands on Metropolitan from each member agency in a given year. Based on a number of factors, including storage and supply conditions, Metropolitan then determines whether it has the ability to meet these firm demands or will need to allocate its limited supplies among its member agencies. Thus, implicit in Metropolitan's decision not to implement

an allocation of its supplies is that at a minimum Metropolitan will be able to meet the firm demands identified for each of the member agencies.

In order to estimate the minimum available supplies from Metropolitan for the period 2011-2013, an analysis was performed to assess the likelihood that Metropolitan would re-implement mandatory water use restrictions in the event of a 1990-92 hydrologic conditions over this period. Specific water management actions during times of water shortage are governed by Metropolitan's Water Shortage and Drought Management Plan (WSDM Plan). Adopted by the Metropolitan Board in 1999, the WSDM Plan provides a general framework for potential storage actions during shortages, but recognizes that storage withdrawals are not isolated actions but part of a set of resource management actions along with water transfers and conservation. As such, there is no specific criterion for which water management actions are to be taken at specific levels of storage. The implementation of mandatory restrictions is solely at the discretion of the Metropolitan Board and there are no set criteria that require the Board to implement restrictions. Given these conditions, the analysis relies upon a review of recent water operations and transactions that Metropolitan has implemented during recent drought.

The first step in the analysis was a review of projected SWP allocations to Metropolitan, based on historical hydrologies. As with the recent drought, potential impacts to SWP supplies from further drought and the recently implemented biological opinions are anticipated to be the biggest challenges facing Metropolitan in the coming three years.

A review of projected SWP allocations from the DWR's State Water Project Delivery Reliability Report 2009 (2009 SWP Reliability Report) was made to estimate a range of conservative supply assumptions regarding the availability of SWP supplies. The 2009 SWP Reliability Report provides estimates of the current (2009) and future (2029) SWP delivery reliability and incorporates regulatory requirements for SWP and CVP operations in accordance with USFWS and NMFS biological opinions. Estimates of future reliability also reflect potential impacts of climate change and sea level rise.

The analysis assumes a maximum SWP allocation available to Metropolitan of 2,011,500 AF and a Metropolitan storage level of 1,700,000 AF at 2010 year-end. The analysis also assumes a stable water supply from the Colorado River in the amount of 1,150,000 AF through 2015. Although the Colorado River watershed has also experienced drought in recent years, Metropolitan has implemented a number of supply programs that should ensure that supplies from this source are relatively steady for the next three years. Based on estimated "firm" demands on Metropolitan of 2.12 MAF, the annual surplus or deficit was calculated for each year of the three-year period.

A review of recent Metropolitan water management actions under shortage conditions was then undertaken to estimate the level of storage withdrawals and water transfers that Metropolitan may exercise under the 1990-92 hydrologic conditions were identified. For

this analysis, it was assumed that, if Metropolitan storage levels were greater than 2 MAF at the beginning of any year, Metropolitan would be willing to take up to 600 TAF out of storage in that year. Where Metropolitan storage supplies were between 1.2 MAF and 2 MAF at the beginning of the year, it was assumed that Metropolitan would be willing to take up to 400 TAF in that year. At storage levels below 1.2 MAF, it was assumed that Metropolitan would take up to 200 TAF in a given year.

It was also assumed that Metropolitan would be willing to purchase up to 300 TAF of water transfer in any given year. For years where demands still exceeded supplies after accounting for storage withdrawals, transfer purchases were estimated and compared against the 300 TAF limit.

Table 5-2: Metropolitan Shortage Conditions

Study Year	Actual Year	SWP Allocation (%)	SWP (AF)	CRA (AF)	Total (AF)	Demand (AF)	Surplus/ Shortage (AF)	Storage at YE (AF)	Transfers (AF)
2011	1990	30%	603,450	1,108,000	1,711,450	2,124,000	(400,000)	1,300,000	(12,550)
2012	1991	27%	542,820	1,108,000	1,650,820	2,123,000	(200,000)	1,100,000	(272,180)
2013	1992	26%	522,990	1,108,000	1,630,990	2,123,000	(200,000)	900,000	(292,010)

Based on the analysis above, Metropolitan would be able to meet firm demands under the driest three-year hydrologic scenario using the recent water management actions described above without re-implementing mandatory water use restrictions on its member agencies. Given the assumed absence of mandatory restrictions, the estimated minimum imported water supplies available to MWDOC from Metropolitan is assumed to be equal to Metropolitan's estimate of demand for firm supplies for MWDOC, which Metropolitan uses when considering whether to impose mandatory restrictions. Thus, the estimate of the minimum imported supplies available to MWDOC is 261,577 AF[5].

MWDOC also has also adopted a shortage allocation plan and accompanying allocation model that estimates firm demands on MWDOC. Assuming MWDOC would not be imposing mandatory restrictions if Metropolitan is not, the estimate of firms demands in MWDOC's latest allocation model has been used to estimate the minimum imported supplies available to each of MWDOC's customer agencies for 2011-13. Thus, the estimate of the minimum imported supplies available to the City is 3,703 AF[6].

As captured in its 2010 RUWMP, Metropolitan believes that the water supply and demand management actions it is undertaking will increase its reliability throughout the 25-year period addressed in its plan. Thus for purposes of this estimate, it is assumed

[5] Metropolitan 2010/11 Water Shortage Allocation Plan model (March 2011)
[6] MWDOC Water Shortage Allocation model (August 2010)

that Metropolitan and MWDOC will be able to maintain the identified supply amounts throughout the three-year period.

Metropolitan projects reliability for full service demands through the year 2035. Additionally, local supplies are projected to be maintained at demand levels. Based on the MWDOC Water Supply Allocation Plan, the City is expected to fully meet demands for the next three years assuming Metropolitan and MWDOC are not in shortage, CDWC and La Habra Basin supplies are maintained at demand levels, and zero allocations are imposed for Imported Supplies. The Three Year Estimated Minimum Water Supply is listed in Table 5-3.

Table 5-3: Three-Year Estimated Minimum Water Supply (AFY)

Source	Year 1	Year 2	Year 3
	2010/2011	2011/2012	2012/2013
Local Supplies	8,110	8,110	8,110
Imported Supplies	3,703	3,703	3,703
Total	*11,813*	*11,813*	*11,813*

5.4. Catastrophic Supply Interruption

Given the great distances that imported supplies travel to reach Orange County, the region is vulnerable to interruptions along hundreds of miles aqueducts, pipelines and other facilities associated with delivering the supplies to the region. Additionally, this water is distributed to customers through an intricate network of pipes and water mains that are susceptible to damage from earthquakes and other disasters.

Metropolitan

Metropolitan has comprehensive plans for stages of actions it would undertake to address a catastrophic interruption in water supplies through its WSDM and WSAP Plans. Metropolitan also developed an Emergency Storage Requirement to mitigate against potential interruption in water supplies resulting from catastrophic occurrences within the southern California region, including seismic events along the San Andreas Fault. In addition, Metropolitan is working with the State to implement a comprehensive improvement plan to address catastrophic occurrences that could occur outside of the Southern California region, such as a maximum probable seismic event in the Delta that would cause levee failure and disruption of SWP deliveries. For greater detail on Metropolitan's planned responses to catastrophic interruption, please refer to Metropolitan's RUWMP.

Water Emergency Response Organization of Orange County

In 1983, the Orange County water community identified a need to develop a plan on how agencies would respond effectively to disasters impacting the regional water distribution system. The collective efforts of these agencies resulted in the formation of the Water Emergency Response Organization of Orange County (WEROC) to coordinate emergency response on behalf of all Orange County water and wastewater agencies, develop an emergency plan to respond to disasters, and conduct disaster training exercises for the Orange County water community. WEROC was established with the creation of an indemnification agreement between its member agencies to protect each other against civil liabilities and to facilitate the exchange of resources. WEROC is unique in its ability to provide a single point of contact for representation of all water and wastewater utilities in Orange County during a disaster. This representation is to the county, state, and federal disaster coordination agencies. Within the Orange County Operational Area, WEROC is the recognized contact for emergency response for the water community.

City of Brea

As a member agency of MWDOC, the City is committed to implementing water conservation measures in conjunction with MWDOC. To offset the future water shortage due to drought or catastrophes, the City continues to explore options for supplemental water supplies and seeks leased or purchased water pumping rights through CDWC to obtain enough supply.

Preparation Actions for Catastrophe are listed in Table 5-4.

Table 5-4: Preparation Actions for Catastrophe

Possible Catastrophe	Preparation Actions
Regional Power Outage	• Metropolitan Water Surplus Management Plan • WEROC Participation • Metropolitan Emergency Storage Requirements
Earthquake	
Supply Contamination	
Terrorist Act which Interrupts Service	

5.5. Prohibitions, Penalties and Consumption Reduction Methods

The Water Conservation and Water Supply Shortage Program Ordinance No. 1123 lists water conservation requirements which shall take effect upon implementation by the City Council. These prohibitions shall promote the efficient use of water, reduce or eliminate

water waste, complement the City's Water Quality regulations and urban runoff reduction efforts, and enable implementation of the City's Water Shortage Contingency Measures. Prohibitions include, but are not limited to, restrictions on outdoor watering, washing of vehicles, food preparation establishments, repairing of leaks and other malfunctions, swimming pools, decorative water features, construction activities, and water service provisions which can be found in Table 5-5.

Table 5-5: Mandatory Prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Watering or irrigation of vegetated areas is prohibited between 10:00 am and 4:00 pm except by use of a hand held device, hose equipped with an automatic shutoff device, or for adjusting or repairing an irrigation system for short periods of time.	Year Round
Watering or irrigation with a device that is not continuously attended to is limited to fifteen (15) minutes per day. Low flow drip type systems, water efficient stream rotor systems, and sensor/weather controlled systems are exempt.	Year Round
Watering vegetated areas in a manner that causes excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter, or ditch is prohibited.	Year Round
Washing hard or paved surfaces is prohibited except to alleviate safety or sanitary hazards using a hand held container, hose with an automatic shut off device, or a low-volume high pressure cleaning machine that recycles used water.	Year Round
Leaks, breaks, and malfunctions in the water user's plumbing or distribution system are prohibited for any period of time after such water waste should have been reasonably discovered and corrected and must be corrected in no more than five (5) days of City notification.	Year Round
All decorative water features must re-circulate water or users must secure a waiver from the City.	Year Round
Washing or hosing down vehicles is prohibited except by use of a hand held container, hose with an automatic shut off device, or at a	Year Round

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
commercial car wash.	
Public places where food and/or beverages are sold may only serve drinking water on request.	Year Round
Commercial lodging establishments must provide an option for guests to not have their used towers and linens laundered.	Year Round
No single pass cooling systems may be installed in new or remodeled buildings.	Year Round
All new commercial car wash and laundry facilities must re-circulate the wash water or obtain a waiver from the City.	Year Round
Food preparation establishments must use water efficient kitchen spray valves.	Year Round
Watering or irrigation of vegetated areas is limited to three (3) days per week from April – October and one (1) day per week from November – March and is prohibited between 10:00 am and 5:00 pm except by use of a hand held device, hose equipped with an automatic shutoff device, low flow irrigation systems, or sensor/weather controlled irrigation systems.	Phase 1
Leaks, breaks, and malfunctions in the water user's plumbing or distribution system are prohibited for any period of time after such water waste should have been reasonably discovered and corrected and must be corrected in no more than seventy two (72) hours of City notification.	Phase 1
Watering or irrigation of vegetated areas is limited to two (2) days per week from April – October and one (1) day per week from November – March and is prohibited between 10:00 am and 5:00 pm except by use of a hand held device, hose equipped with an automatic shutoff device, low flow irrigation systems, or sensor/weather controlled irrigation systems.	Phase 2
Leaks, breaks, and malfunctions in the water user's plumbing or distribution system are prohibited for any period of time after such water waste should have been reasonably discovered and corrected and must be corrected in no more than forty eight (48) hours of City notification.	Phase 2

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Filling or refilling ornamental lakes and ponds is prohibited. Ornamental lakes and ponds that sustain aquatic life of significant value and were actively managed prior to the storage declaration are exempt.	Phase 2
Washing or hosing down vehicles is prohibited except by use of a hand held hose equipped with an automatic shut off device, a hand held container, a high volume low pressure cleaner, or at a commercial car wash that recycles its water.	Phase 2
Refilling with more than one foot of water and initial filling of outdoor pools and spas is prohibited.	Phase 2
Watering or irrigating of any vegetated area is prohibited.	Phase 3
Leaks, breaks and, malfunctions in the water user's plumbing or distribution system are prohibited for any period of time after such water waste should have been reasonably discovered and corrected and must be corrected in no more than twenty four (24) hours of City notification.	Phase 3
No new potable water service, meters, or will-serve letters will be provided except under one or more of the following: a. Projects necessary to protect public health, safety, and/or well being. b. Projects with a valid unexpired building permit. Projects with applicants who can provide substantial evidence of an enforceable commitment that water demands will be offset prior to the provision of new water meters to the satisfaction of the City.	Phase 3
Users who continually violate conservation provisions may have their service discontinued.	Phase 3
The City may shut off all non-essential water services.	Phase 4

Consumption Reduction Methods

Methods to reduce the use of potable water exist in all Water Shortage Levels which are expected to reduce consumption up to 40 percent or more in the most restrictive stages are found in Table 5-6.

Table 5-6: Consumption Reduction Methods

Consumption Reduction Methods	Stage When Method Takes Effect
Demand reduction program	All stages
Reduce pressure in water lines	
Flow restriction	IV
Restrict building permits	II, III, IV
Restrict for only priority uses	
Use prohibitions	All stages
Water shortage pricing	All stages
Per capita allotment by customer type	IV
Plumbing fixture replacement	
Voluntary rationing	I
Mandatory rationing	II, III, IV
Incentives to reduce water consumption	
Education program	All stages
Percentage reduction by customer type	II, III, IV

Penalties for Excessive Use

Any customer who violates provisions of the Water Conservation and Water Supply Shortage Program Ordinance by either excess use of water or by specific violation of one or more of the applicable water use restrictions for a particular mandatory conservation stage may be cited by the City and may be subject to written notices, surcharges, fines, flow restrictions, service disconnection, and/or service termination which are detailed in Table 5-7.

Table 5-7: Penalties and Charges

Penalties or Charges	Stage When Penalty Takes Effect
Written Warning	First Violation
Fine not to exceed one hundred dollars ($100).	Second Violation
Fine not to exceed two hundred and fifty dollars ($250).	Third Violation
Fine not to exceed five hundred dollars ($500). In addition to the fine, the City may install a flow restrictor device and/or terminate service with the customer responsible for all reasonable charges related to installation and removal of the flow restrictor device and/or reinstatement of normal service.	Fourth and Subsequent Violations

5.6. Impacts to Revenue

All surplus revenues that the City collects are currently used to fund and promote water conservation, and other facility improvements. The City will continue to invest the revenues and expenditures on both facilities improvement and enforcement of water conservation under the assistance of funding from the MWDOC.

Table 5-8: Proposed Measures to Overcome Revenue Impacts

Name of Measures
Rate Adjustment
Development of Reserves

5.7. Reduction Measuring Mechanism

Under normal water supply conditions, production figures are recorded daily and incorporated into daily and monthly reports. Following each fiscal year end, reports documenting water supply and demand are generated. The records are maintained by the Water Superintendent and reviewed by the Director of Public Works.

During a drought, supply and demand are reviewed daily and weekly. Monthly goals are established. The Director of Public Works reports the status of conservation efforts to the City Council on a monthly basis. During a disaster shortage, the City response will reflect the City's Emergency Response Plan.

Table 5-9: Water Use Monitoring Mechanisms

Mechanisms for Determining Actual Reductions	Type of Data Expected
Daily and monthly reports.	Production Figures
Annual Reports	Water Supply and Demand.
MWDOC Water Use Monthly Reports	Comparison of cumulative retail usage to allocation baseline.

6. Recycled Water

6.1. Agency Coordination

The City does not own or operate wastewater treatment facilities and sends all collected wastewater to OCSD for treatment and disposal. The City relies on imported and local groundwater for the majority of its water supply. OCWD and OCSD have jointly constructed two water recycling projects, described below:

OCWD Green Acres Project

The Green Acres Project (GAP) is a water recycling effort that provides recycled water for landscape irrigation at parks, schools and golf courses as well as for industrial uses, such as carpet dyeing.

GAP provides an alternate source of water to the cities of Fountain Valley, Huntington Beach, Newport Beach, Santa Ana, and Mesa Consolidated Water District. Current water users include Mile Square Park in Fountain Valley, Costa Mesa Golf Course, Home Ranch bean field and Chroma Systems carpet dyeing. Due to a growing demand for water in Orange County, it is sensible that recycled water be used whenever possible for irrigation and industrial uses to supplement groundwater. The use of GAP water will diminish to approximately 3 MGD upon completion of OCSD's P1-102 (Fountain Valley Wastewater Secondary Treatment Expansion) project in the fall of 2011.

OCWD Groundwater Replenishment System

The Groundwater Replenishment System (GWRS), which has been operational since January 2008, takes highly treated sewer water and purifies it to levels that meet state and federal drinking water standards. It uses a three-step process that includes reverse osmosis, microfiltration, and ultraviolet light and hydrogen peroxide advanced oxidation treatment. The treated water is then injected into the seawater barrier to help prevent seawater intrusion into the groundwater basin and is percolated into deep aquifers where it eventually becomes part of Orange County's drinking water supply.

The design and construction of the GWRS was a project jointly-funded by OCWD and OCSD. These two public agencies have worked together for more than 30 years. They are leading the way in water recycling and providing a locally-controlled, drought-proof and reliable supply of high-quality water in an environmentally sensitive and economical manner.

The first step, Microfiltration (MF), is a separation process that uses polypropylene hollow fibers, similar to straws, with tiny holes in the sides that are 0.2 micron in diameter. By drawing water through the holes into the center of the fibers, suspended solids, protozoa, bacteria and some viruses are filtered out of the water.

In the second step, Reverse osmosis (RO), membranes are made of semi-permeable polyamide polymer (plastic). During the RO process, water is forced through the molecular structure of the membranes under high pressure, removing dissolved chemicals, viruses and pharmaceuticals in the water. The end result is near-distilled-quality water so pure that minerals have to be added back in to stabilize the water. RO has been successfully used by OCWD since the mid-1970s to purify highly-treated wastewater for its seawater intrusion barrier at its Water Factory 21 (WF-21) from 1975-2004.

In the third step, water is exposed to high-intensity ultraviolet (UV) light with hydrogen peroxide (H2O2) to disinfect and destroy any trace organic compounds that may have passed through the reverse osmosis membranes. Examples of these trace organic compounds are N-Nitrosodimethylamine (NDMA) and 1-4 Dioxane, which have to be removed to the parts-per-trillion level. UV with H2O2 is an effective disinfection/advanced oxidation process that keeps these compounds from reaching drinking water supplies.

The GWRS has a current production capacity of 70 MGD, and a total production of 23.5 billion gallons per year. Once the water has been treated with the three-step process at the GWRS as described above, approximately 35 MGD of GWRS water is pumped into injection wells where it serves as a seawater intrusion barrier. Another 35 MGD is pumped to recharge basins in the City of Anaheim, where GWRS water filters through sand and gravel to replenish the deep aquifers of north and central Orange County's groundwater basin. At this time, OCWD has designed Phase 2 of the expansion, which will recycle approximately another 28 MGD of effluent. Investments beyond Phase 2 have not been approved by OCWD and would require further review before proceeding. If the further envisioned phase of the project is approved and developed, it is projected that up to 118 MGD of water will be produced.

Table 6-1: Participating Agencies

Participating Agencies	Participated
Water Agencies	Brea
Wastewater Agencies	OCSD
Groundwater Agencies	CDWC

6.2. Wastewater Description and Disposal

The City collects wastewater through the City-owned and maintained sewage system. Treatment and final disposal is handled by the Orange County Sanitation District. It is impractical to construct a City-owned and operated wastewater treatment facility. The City is a member agency of OCSD.

Table 6-2 summarizes the past, current, and projected wastewater volumes collected and treated, and the quantity of wastewater treated to recycled water standards for treatment plants within OCSD's service area. Table 6-3 summarizes the disposal method, and treatment level of discharge volumes.

Table 6-2: Wastewater Collection and Treatment (AFY)

Type of Wastewater	Fiscal Year Ending						
	2005	2010	2015	2020	2025	2030	2035-opt
Wastewater Collected & Treated in Service Area	273,017	232,348	302,400	312,704	321,104	329,392	333,536
Volume that Meets Recycled Water Standards	12,156	75,000	105,000	105,000	105,000	105,000	105,000

Table 6-3: Disposal of Wastewater (Non-Recycled) (AFY)

Method of Disposal	Treatment Level	Fiscal Year Ending					
		2010	2015	2020	2025	2030	2035-opt
Ocean Outfall	Secondary	157,348	197,400	207,704	216,104	224,392	228,536

6.3. Current Recycled Water Uses

There are currently no recycled water uses within the City's service area.

6.4. Potential Recycled Water Uses

Currently, the City has no ability to capture and treat wastewater generated within the City, and MWDOC presently has no plans to extend a recycled water system towards the City.

Table 6-4 compares the recycled water use projections from the City's 2005 UWMP with actual 2010 recycled water use.

Table 6-4: Recycled Water Uses – 2005 Projections compared with 2010 Actual (AFY)

User Type	2005 Projection for 2010	Fiscal Year Ending
		2010 Actual Use
Agriculture		
Landscape		
Wildlife Habitat		
Wetlands		
Industrial		
Groundwater Recharge		
Total	**0**	**0**

6.4.1. Direct Non-Potable Reuse

The City does not have the potential for direct non-potable reuse within their service area due to no existing recycled water system.

6.4.2. Indirect Potable Reuse

The City does not have the potential for indirect potable reuse within their service area.

6.5. Optimization Plan

Because the City is not using recycled water at this time, it is not practicable to provide a recycled water optimization plan. The City has positioned itself to receive recycled water if it becomes available to serve some of the large development areas.

In Orange County, the majority of recycled water is used for irrigating golf courses, parks, schools, business and communal landscaping. However, future recycled water use can increase by requiring dual piping in new developments, retrofitting existing landscaped areas and constructing recycled water pumping stations and transmission mains to reach areas far from the treatment plants. Gains in implementing some of these projects have been made throughout the county; however, the additional costs, large energy requirements and facilities to create such projects are very expensive to pursue.

To determine if a recycled water project is cost-effective, cost/benefit analyses must be conducted for each potential project. This brings about the discussion on technical and economic feasibility of a recycled water project requiring a relative comparison to alternative water supply options. Analyses indicate that capital costs of water recycling in the City exceed the cost of purchasing additional imported water from Metropolitan.

The City will continue to conduct cost/benefit analyses for recycled various water projects, and seek creative solutions and a balance to recycled water use, in coordination with Metropolitan and other cooperative agencies. These include solutions for funding, regulatory requirements, institutional arrangements and public acceptance.

7. Future Water Supply Projects and Programs

7.1. Water Management Tools

Resource optimization such as desalination to minimize the needs for imported water is led by the regional agencies in collaboration with local agencies.

With the eventual replacement of older wells with new more efficient wells, increasing the capacity of existing booster stations, and continued efforts in reducing water waste, the City can meet projected demands with existing facilities and distribution system.

7.2. Transfer or Exchange Opportunities

MWDOC is presently exploring the possibility of "dry-year" transfers from the Central Valley of California in order to increase supply reliability to Orange County. Although similar transfers are not widely expanded to other water agencies within Orange County, once Metropolitan establishes a wheeling charge, the financial feasibility of such transfers can be better analyzed. Metropolitan is currently developing a policy for separating the cost of wheeling water within the region and establishing appropriate charges.

Metropolitan also entered into a 30-year exchange agreement in 1998 with the San Diego County Water Authority (SDCWA) to make up to 200,000 AF of conserved water available to Metropolitan annually, and Metropolitan will deliver an equal amount of exchange water to the SDCWA.

MWDOC will continue to help its member agencies in developing these opportunities and ensuring their success. In fulfilling this role, MWDOC will look to help its member agencies navigate the operational and administrative issues of wheeling water through the Metropolitan water distribution system.

7.3. Planned Water Supply Projects and Programs

At this time, the City does not have any planned water supply projects or water supply programs.

7.4. Desalination Opportunities

Until recently, seawater desalination had been considered uneconomical to be included in the water supply mix. However, recent breakthroughs in membrane technology and plant

sitting strategies have helped reduce desalination costs, warranting consideration among alternative resource options.

MWDOC has been in the process of studying the feasibility of ocean desalination on behalf of its member agencies, but implementation of large-scale seawater desalination plants faces considerable challenges. These challenges include high capital and operation costs for power and membrane replacement, availability of funding measures and grants, addressing environmental issues and addressing the requirements of permitting organizations such as the Coastal Commission. These issues require additional research and investigation. MWDOC is reviewing and assessing treatment technologies, pretreatment alternatives, and brine disposal issues. Identifying and evaluating resource issues such as permitting and the regulatory approvals (including CEQA) associated with the delivery of desalinated seawater to regional and local distribution systems also present considerable challenges.

MWDOC is also assisting its member agencies in joint development of legislative strategies to seek funding in the form of grants and/or loans, and to inform decision-makers of the role of seawater desalination in the region‘s future water supplies. Strategies and outcomes of other agency programs (such as Tampa Bay, Florida) are being observed to gain insights into seawater desalination implementation and cost issues.

The City has not, on its own, attempted to investigate seawater desalination due to economic and physical impediments.

In Orange County, there are three proposed ocean desalination projects that could serve MWDOC and its member agencies with additional water supply. These are the Huntington Beach Seawater Desalination Project, the South Orange Coastal Desalination Project, and the Camp Pendleton Seawater Desalination Project.

Table 7-1: Opportunities for Desalinated Water

Sources of Water	Check if Yes
Ocean Water	X
Brackish Ocean Water	X
Brackish Groundwater	

7.4.1. Groundwater

There are currently no brackish groundwater opportunities within the City’s service area.

7.4.2. Ocean Water

Huntington Beach Seawater Desalination Project – Poseidon Resources LLC (Poseidon), a private company, has proposed development of the Huntington Beach Seawater Desalination Project to be located adjacent to the AES Generation Power Plant in the City of Huntington Beach along Pacific Coast Highway and Newland Street. The proposed project would produce up to 50 MGD (56,000 AFY) of drinking water and will distribute water to coastal and south Orange County to provide approximately 8% of Orange County's water supply needs. The project supplies would be distributed to participating agencies through a combination of (1) direct deliveries through facilities including the East Orange County Feeder #2 (EOCF #2), the City of Huntington Beach's distribution system, and the West Orange County Water Board Feeder #2 (WOCWBF #2), and (2) water supply exchanges with agencies with no direct connection to facilities associated with the Project.

Poseidon had received non-binding Letters of Intent (LOI) from the Municipal Water District of Orange County and 17 retail water agencies to purchase a total of approximately 72 MGD (88,000 AFY) of Project supplies.

The Project has received specific approvals from the Huntington Beach City Council, including the Coastal Development Permit, Tentative Parcel Map, Subsequent Environmental Impact Report (EIR) and Conditional Use Permit, which collectively provided for the long-term operation of the desalination facility.

In addition to final agreements with the participating agencies, the Project still needs approvals from the State Lands Commission and the California Coastal Commission before Poseidon can commence construction of the desalination facility in Huntington Beach. A public hearing on the Project before the State Lands Commission is expected as early as this October. If project receives all required permits by 2011, it could be producing drinking water for Orange County by as soon as 2013.

South Orange Coastal Desalination Project – MWDOC is proposing a desalination project in joint with Laguna Beach County Water District, Moulton Niguel Water District, City of San Clemente, City of San Juan Capistrano, South Coast Water District, and Metropolitan. The project is to be located adjacent to the San Juan Creek in Dana Point just east of the transition road from PCH to the I-5. The project will provide 15 MGD (16,000 AFY) of drinking water and will provide up to 30% of its potable water supply to the participating agencies.

Phase 1 consists of drilling 4 test borings and installing monitoring wells. Phase 2 consists of drilling, constructing and pumping a test slant well. Phase 3 consists of constructing a Pilot Test Facility to collect and assess water quality. Phases 1 and 2 have been completed and Phase 3 commenced in June 2010 and will last 18 months.

If pumping results are favorable after testing, a full-scale project description and EIR will be developed. If EIR is adopted and necessary permits are approved, project could be operational by 2016.

Camp Pendleton Seawater Desalination Project– San Diego County Water Authority (SDCWA) is proposing a desalination project in joint with Metropolitan to be located at Camp Pendleton Marine Corps Base adjacent to the Santa Margarita River. The initial project would be a 50 or 100 MGD plant with expansions in 50 MGD increments up to a max of 150 MGD making this the largest proposed desalination plant in the US.

The project is currently in the study feasibility stage and is conducting geological surveys to study the effect on ocean life and examining routes to bring desalination to SDCWA's delivery system. MWDOC and south Orange County agencies are maintaining a potential interest in the project, but at this time is only doing some limited fact finding and monitoring of the project.

8. UWMP Adoption Process

8.1. Overview

Recognizing that close coordination among other relevant public agencies is the key to the success of its UWMP, the City worked closely with other entities such as MWDOC to develop and update this planning document. The City also encouraged public involvement through the holding of a public hearing during which participants learned and asked questions about their water supply.

This section provides the information required in Article 3 of the Water Code related to adoption and implementation of the UWMP. Table 8-1 summarizes external coordination and outreach activities carried out by the City and their corresponding dates. The UWMP checklist to confirm compliance with the Water Code is provided in Appendix A.

Table 8-1: External Coordination and Outreach

External Coordination and Outreach	Date	Reference
Encouraged public involvement (Public Hearing)	May 19, 2011 & May 26, 2011	Appendix E
Notified city or county within supplier's service area that water supplier is preparing an updated UWMP (at least 60 days prior to public hearing)	March 28, 2011	Appendix D
Held public hearing	June 7, 2011	Appendix E
Adopted UWMP	June 7, 2011	Appendix F
Submitted UWMP to DWR (no later than 30 days after adoption)	July 7, 2011	
Submitted UWMP to the California State Library and city or county within the supplier's service area (no later than 30 days after adoption)	July 7, 2011	
Made UWMP available for public review (no later than 30 days after filing with DWR)	August 6, 2011	

This UWMP was adopted by the City Council on June 7, 2011. A copy of the adopted resolution is provided in Appendix F.

A change from the 2004 legislative session to the 2009 legislative session required the City to notify any city or county within its service area at least 60 days prior to the public

hearing. The City sent a Letter of Notification to the County of Orange on March 28, 2011 that it is in the process of preparing an updated UWMP (Appendix D).

8.2. Public Participation

The City encouraged community and public interest involvement in the plan update through a public hearing and inspection of the draft document. Public hearing notifications were published in local newspapers. A copy of the published Notice of Public Hearing is included in Appendix E. The hearing provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply in addition to the City's plans for providing a reliable, safe, high-quality water supply. Copies of the draft plan were made available for public inspection at the City Clerk's and Utilities Department offices.

8.3. Agency Coordination

All of the City's water supply planning relates to the policies, rules, and regulations of its regional and local water providers. The City is dependent on imported water from Metropolitan through MWDOC, its regional wholesaler. The City is also dependent on imported groundwater from CDWC, a mutual water company which owns rights to and supplies water from the Main San Gabriel Basin, an adjudicated basin. Therefore, development of this plan has been coordinated with the involved parties at various levels of contribution as summarized in Table 8-2.

Table 8-2: Coordination with Appropriate Agencies

	Participated in Plan Development	Commented on Draft	Attended Public Meetings	Contacted for Assistance	Sent Copy of Draft Plan	Sent Notice of Intention to Adopt	Not Involved/No Information
Metropolitan Water District				X		X	
Municipal Water District of O.C.				X		X	
Cal Domestic Water Company				X		X	
Main Basin Water Master						X	
Upper San Gabriel Municipal Water District						X	

As a member agency of MWDOC, MWDOC provided assistance to the City's 2010 UWMP development by providing much of the data and analysis such as, population projections, demand projections, and SBx7-7 modeling. The City's UWMP was developed in collaboration with MWDOC's 2010 Regional UWMP to ensure consistency between the two documents as well as Metropolitan's 2010 Regional UWMP and 2010 Integrated Water Resources Plan.

8.4. UWMP Submittal

8.4.1. Review of Implementation of 2005 UWMP

As required by California Water Code, the City summarizes the implementation of the Water Conservation Programs to date, and compares the implementation to those as planned in its 2005 UWMP.

Comparison of 2005 Planned Water Conservation Programs with 2010 Actual Programs

The City recognizes the importance of water conservation and has made water use efficiency an integral part of water use planning. The City is not a California Urban

Water Conservation Council (CUWCC) signatory; however, it is currently implementing all 14 DMMs described in the Act. DMMs as defined by the Act correspond to the CUWCC's Best Management Practices (BMPs). For the City's specific achievements in the area of conservation, please see Section 4 of this Plan.

8.4.2. Filing of 2010 UWMP

The City Council reviewed the Final Draft Plan on June 7, 2011. The five-member City Council approved the 2010 UWMP on June 7, 2011. See Appendix F for the resolution approving the Plan.

By July 7, 2011, the City's Adopted 2010 UWMP was filed with DWR, California State Library, County of Orange, and cities within its service area.

Appendices

A. Urban Water Management Plan Checklist
B. Calculation of Dry Year Demands
C. Ordinance No. 1123
D. 60 Day Notification Letters
E. Public Hearing Notice
F. Copy of Plan Adoption

Appendix A

Urban Water Management Plan Checklist

Urban Water Management Plan checklist, organized by subject

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 8.3
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Appendix D
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		Section 8.4
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Section 8.4
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Section 8.2
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Appendix E
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		Appendix F
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Section 8.4

No.	UWMP requirement a	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Section 8.4
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Section 8.4
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Section 1.2.1
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Section 2.2.1
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M	Section 2.2.2
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2.2.2
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		Section 2.2.3
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Section 2.4.4 Section 2.4.5
2	Wholesalers: Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. Retailers: Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	Appendix E Section 2.4.6

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		Not applicable
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Section 2.3
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Section 2.5
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		Section 2.5.2
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Section 3.1
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section 3.3
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		Not applicable
16	Describe the groundwater basin.	10631(b)(2)		Section 3.3.1
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		Not applicable

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Not applicable
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Section 3.3
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Section 3.3.2
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Section 3.3.3
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 7.2
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 7.3
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 7.4
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Section 6.1
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 6.2

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Section 6.2
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 6.3
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 6.4
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Section 6.4
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 6.5
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 6.5
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING [b]				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Section 3
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Section 3.4.1
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Section 3.4.2
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Section 5.2

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Section 5.3
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 5.4
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Section 5.5
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 5.5
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 5.5
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 5.6
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Appendix C
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Section 5.7
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	Four years 2010, 2015, 2020, 2025, and 2030	Section 3.4.2.1

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 3.4.3 Section 3.4.4 Section 3.4.5
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 4
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 4
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Section 4
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Not applicable
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Not applicable

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review

Appendix B

Calculation of Dry Year Demands

Demand "Bump" Factors for 2010 UWMP
Description of Methodology

Water agencies must develop estimates of the impacts of single dry years (Single-Dry) and multiple consecutive dry years (Multiple-Dry) on both supplies and demands in future years. In these cases, demands increase somewhat above the normal or average level. The increase can be expressed as a percent "bump" up from the normal level. For example, if dry year demand was 105 percent of normal, this would be a 5% "bump". As the methodology to estimate the Single-Dry and Multiple-Dry "bumps" was developed, several issues needed to be decided, as follows:

1. The methodology used existing data from MWDOC records for each agency, to allow the estimates to reflect the characteristics and differences of demands relative to the makeup of each retail entity. The overall MWDOC estimate was developed from a weighted sum of all of OC's agencies.

2. Total potable demands, including agricultural demands, were used to derive the "bumps" because Orange County agencies have opted to have water that is used for agricultural uses be considered as full service demands. Non-potable demands are included; these demands will be met with non-potable supplies.

3. The methodology focused on per-capita usage (in units of AF/capita) because this removes the influence of growth from the analysis. Overall population growth in Orange County has been about 1% per year over the past two decades, creating about a 20% increase in demand over two decades. Some of the agencies have had even higher growth.

4. The period that was used for the analysis was limited to FY 1992-93 thru FY 2008-09 because fiscal years 1991-92 and 2009-10 were years of extraordinary conservation-- pricing disincentives for using over the allocated amounts were implemented in order to curtail demands-- and so these years were not considered. The Orange County total per-capita water usage in the period FY 1992-93 thru FY 2008-09 is plotted in Figure 1. Per-capita water use in Orange County has been on a decreasing trend in recent years as shown by the trend line in Figure 1. The downward trend is likely due to water use efficiency efforts, principally the plumbing codes since 1992 that have required low-flush toilets in all new construction and prohibited the sale of high-flush toilets for replacement purposes. Because of this drop in per-capita usage over time, the more recent data is a better predictor of future usage than the earlier data. Therefore, we narrowed the focus to the period FY 2001-02 thru FY 2008-09.

5. **Single-Dry "Bump" Methodology:** Per-capita usage for each participant agency from FY 2001-02 thru FY 2008-09 is shown in Table 1. The Single-Dry Bump for each agency was derived using the highest per-capita usage in the period, divided by average per-capita usage for that period. Because of suspect data for Fountain Valley and Santa Ana, the highest year data was eliminated and the second-highest usage in the period was used (when data was suspect, it was also removed from the average for the agency). The resulting Single-Dry "bumps" are shown in Table 2. The OC-average Single-Dry "bump" came to 6.6%

6. **Multiple-Dry "Bump" Methodology:** DWR guidelines recommend that "multiple" years is three years. There are various methods that can be used to derive demand "bumps" for those three years. The same "bump" can be used for all three years, or different "bumps" can be assumed for each of the three years. A pattern can be selected based on historical demand data or on historical water supply data or on another basis. MWDOC selected a Multiple-Dry Bump as the same as the Single-Dry Bump for each agency. This means having three highest-demand years in a row. This is conservative because it would be extremely unlikely for three driest years to occur in a row. However, it should be noted that future demand in any particular year depends on other factors in addition to rainfall, such as the economic situation, and cloudiness, windiness, etc. The OC-average Multiple-Dry "bump" came to 6.6%.

Figure 1
Per-Capita Water Use in Orange County (AF/person)

FY Ending	OC Actual AF/person	Least Sq AF/person	approx high	approx "bump"
1993	0.223327	0.233	0.250	7%
1994	0.223528	0.232		
1995	0.221986	0.230		
1996	0.235919	0.229		
1997	0.244071	0.228		
1998	0.217014	0.226		
1999	0.228797	0.225		
2000	0.242408	0.224		
2001	0.223537	0.222		
2002	0.228534	0.221		
2003	0.214602	0.219		
2004	0.222155	0.218		
2005	0.204941	0.217		
2006	0.207720	0.215		
2007	0.223599	0.214		
2008	0.211873	0.212		
2009	0.202396	0.211	0.225	7%

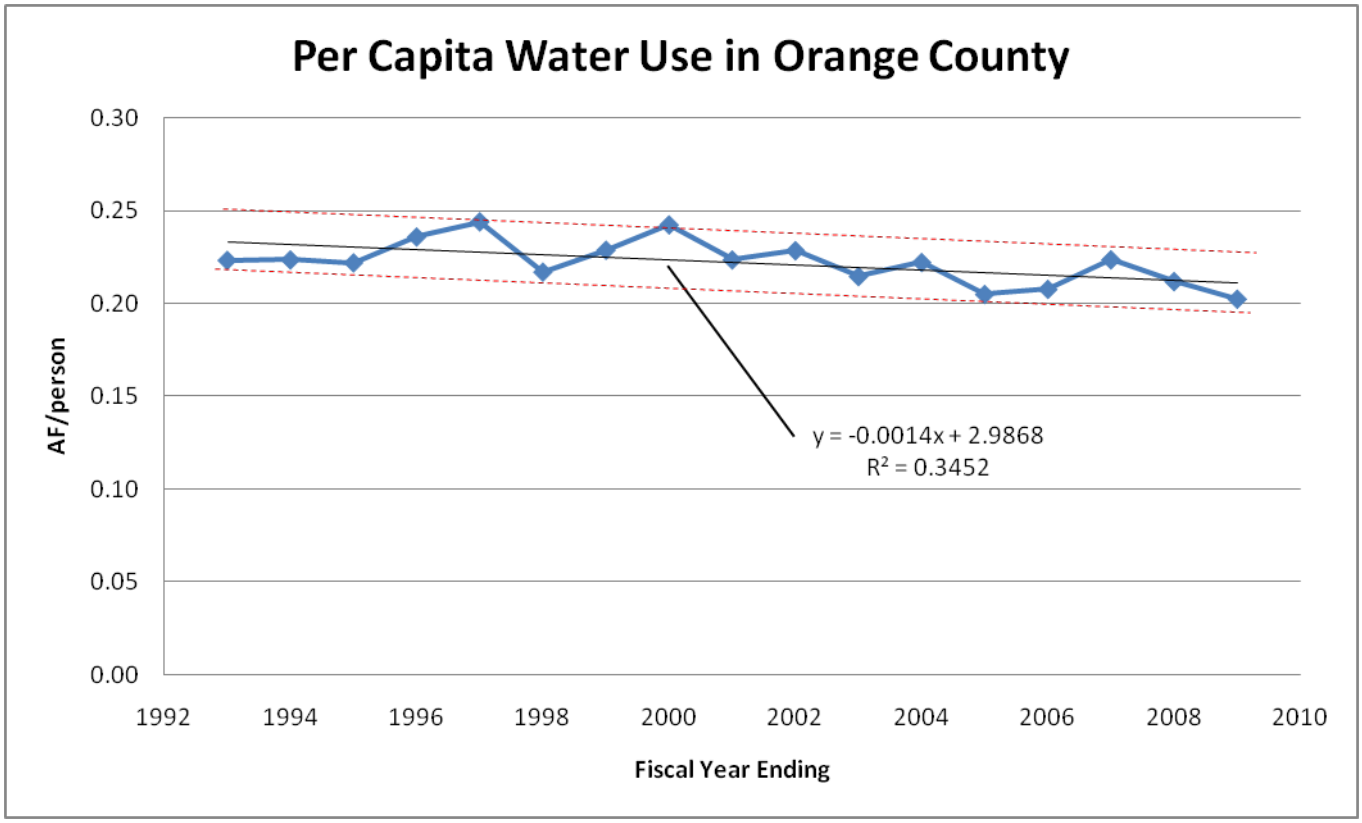

Table 1. Per-Capita Retail Water Usage by Retail Water Agency [1] [2]

Fiscal Year ->	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09
	Per Capita Retail Water Usage (AF/person)							
Brea	0.31745	0.28299	0.31137	0.28272	0.28176	0.31149	0.28878	0.26105

[1] Retail water usage (includes recycled water and Agricultural usage) divided by population.
[2] Population is for Jan. 1 of each fiscal year ending. Source: Center for Demographic Research, CSU Fullerton.

Table 2
Demand Increase "Bump" Factors for Single Dry Years and Multiple Dry Years
for OC Water Agencies participating in MWDOC's 2010 UWMP group effort

	Single	Multiple	
Brea	8.6%	8.6%	
OC Average	6.6%	6.6%	weighted average of all OC water agencies

Appendix C

Ordinance No. 1123

ORDINANCE NO. 1123

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF BREA REVISING WATER CONSERVATION AND WATER SUPPLY SHORTAGE PROGRAM REQUIREMENTS AND AMENDING TITLE 13 OF THE BREA CITY CODE

A. RECITALS:

WHEREAS, the City of Brea depends on imported water from Northern California and the Colorado River to meet approximately half of its supply demand: and

WHEREAS, California has had one of the driest years on record, with eight of the past ten years meeting drought-level conditions; and

WHEREAS, storage in the Colorado River system has dropped to fifty-five percent of total capacity; and

WHEREAS, the flow of the California Aqueduct has been restricted by up to thirty-five percent, due to a federal court ruling to protect the Delta Smelt; and

WHEREAS, the Governor of the State of California proclaimed a statewide drought and issued a State of Emergency to address the California water shortage, requesting that all water users reduce their water use by twenty percent and asking all water agencies to assist their customers in reducing their use through a water conservation program; and

WHEREAS, the Orange County Grand Jury investigated solutions into the looming water crisis in California and recommends in its report for local water agencies a goal of ten percent voluntary conservation, a focus on outdoor usage, the

development of monthly allocations for each customer and the implementation of conservation-inducing pricing; and

WHEREAS, the Metropolitan Water District of Southern California is currently in a "Water Supply Alert" phase and urges implementation of "extraordinary conservation measures", such as conservation pricing, outdoor water restrictions, prohibition of runoff, enhanced rebates, and coordination with the Municipal Water District of Orange County to develop a unified regional message and to accelerate media and outreach campaigns; and

WHEREAS, the Metropolitan Water District of Southern California is requiring ordinances from all agencies that receive rebate incentives detailing water conservation measures, prohibitions against water waste and associated penalties; and

WHEREAS, the Municipal Water District of Orange County, the agency responsible for providing the City of Brea with imported water through the Metropolitan Water District, has enacted a resolution asking every Orange County resident and business to immediately reduce their water usage by ten-percent; and

WHEREAS, the adoption of water conservation measures would assist in avoiding or minimizing the effects of water supply restrictions and a water shortage in Southern California.

B. ORDINANCE:

NOW, THEREFORE, the City Council of the City of Brea hereby ordains as follows:

Under the authority of Water Code §§ 350 and 31026, that the City of Brea, does hereby **FIND AND DETERMINE** that matters set forth in the above recitals are true and correct, and that the City of Brea therefore **DECLARES** the existence of an emergency caused by drought or other threatened or existing water shortage; and

THEREFORE, BE IT ORDAINED, under the authority of Water Code §§ 350 and 31026, that the City of Brea, does hereby **FIND, DETERMINE AND DECLARE** that water conservation measures and restriction on the use of water are necessary and appropriate to protect the health and safety of water users within the City of Brea; and

THEREFORE, BE IT ORDAINED, under authority of Water Code §§ 353 and 31026, that the City of Brea, based upon the findings set forth herein, does hereby **PROHIBIT** the wastage of water and does hereby ORDER that the following water conservation measures and water use restrictions are necessary and appropriate to prevent the waste of water and to protect the health and safety of water users.

SECTION 1.

Chapter 13.20 of Title 13 of the Brea City Code is hereby repealed provided, however, that such repeal shall not affect or excuse any violation thereof occurring prior to the effective date of this Ordinance.

SECTION 2.

A new Chapter 13.20 is hereby added to Title 13 of the Brea City Code to read as follows:

CHAPTER 13.20: WATER MANAGEMENT PROGRAM

SECTIONS:

§ 13.20.010 Title.

This chapter will be known as the City of Brea Water Conservation Water Supply Shortage Program.

§13.20.020 Findings.

A. A reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of the Southern California region.

B. Southern California is a semi-arid region and is largely dependent upon imported water supplies. A growing population, climate, environmental concerns, and other factors in other parts of the State and western United States, make the region highly susceptible to water supply reliability issues.

C. Careful water management that includes active water conservation measures not only in times of drought, but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs.

D. Article XI, Section 7 of the California Constitution declares that a city or county may make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with general laws.

E. Article X, Section 2 of the California Constitution declares that the general welfare requires that water resources be put to beneficial use, waste or unreasonable use or unreasonable method of use of water be prevented,

and conservation of water be fully exercised with a view to the reasonable and beneficial use thereof.

F. California Water Code section 375 authorizes water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve supplies.

G. The adoption and enforcement of a water conservation and supply shortage program is necessary to manage the City's potable water supply in the short and long-term and to avoid or minimize the effects of drought and shortage within the City. Such program is essential to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

§13.20.030 Declaration of Purpose and Intent.

A. The purpose of this chapter is to establish a water conservation and supply shortage program that will reduce water consumption within the City through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the City to avoid and minimize the effect and hardship of water shortage to the greatest extent possible.

B. This chapter establishes permanent water conservation standards intended to alter behavior related to water use efficiency for non-shortage conditions and further establishes three phases of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing

restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

§13.20.040 Definitions.

The following words and phrases whenever used in this chapter have the meaning defined in this section:

1. "City" means the City of Brea
2. "Person" means any natural person or persons, corporation, public or private entity, governmental agency or institution, or any other user of water provided by the City.
3. "Landscape Irrigation System" means an irrigation system with pipes, hoses, spray heads, or sprinkling devices that are operated by hand or through an automated system.
4. "Large Landscape Areas" means a lawn, landscape, or other vegetated area, or combination thereof, equal to more than one (1) acre of irrigable land.
5. "Single Pass Cooling Systems" means equipment where water is circulated only once to cool equipment before being disposed.
6. "Potable Water" means water which is suitable for drinking.
7. "Recycled Water" means the reclamation and reuse of non-potable water for beneficial use.
8. "Billing Unit" means the unit of water used to apply water rates for purposes of calculating water charges for a person's water usage and equals seven hundred forty eight (748) gallons of water.

§13.20.050 Application.

A. The provisions of this chapter apply to any person in the use of any potable water provided by the City.

B. The provisions of this chapter do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire and other similar emergency services.

C. The provisions of this chapter do not apply to the use of recycled water, except where expressly provided.

D. The provisions of this chapter do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops or other vegetation intended for commercial sale.

E. This chapter is intended solely to further the conservation of water. It is not intended to implement any provision of federal, State, or local statutes, ordinances, or regulations relating to protection of water quality or control of drainage or runoff. Refer to the local jurisdiction or Regional Water Quality Control Board for information on any stormwater ordinances and stormwater management plans.

§13.20.060 Permanent Water Conservation Requirements – Prohibition Against Waste.

The following water conservation requirements are effective at all times and are permanent. Violations of this section will be considered waste and an unreasonable use of water.

A. Limits on Watering Hours: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 10 a.m. and 4 p.m. Pacific Standard Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

B. Limit on Watering Duration: Watering or irrigating of lawn, landscape or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than fifteen (15) minutes watering per day per station. This subsection does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard.

C. No Excessive Water Flow or Runoff: Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.

D. No Washing Down Hard or Paved Surfaces: Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of

a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device or a low-volume, high-pressure cleaning machine equipped to recycle any water used.

E. Obligation to Fix Leaks, Breaks or Malfunctions: Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonably been discovered and corrected and in no event more than 5 days of receiving notice from the City, is prohibited.

F. Re-circulating Water Required for Water Fountains and Decorative Water Features: Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited unless a waiver has been obtained.

G. Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This subsection does not apply to any commercial car washing facility.

H. Drinking Water Served Upon Request Only: Eating or drinking establishments, including but not limited to a restaurant, hotel, cafe, cafeteria, bar, club or other public place where food or drinks are sold,

served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

I. Commercial Lodging Establishments Must Provide Option to Not Launder Linen Daily: Hotels, motels and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language.

J. No Installation of Single Pass Cooling Systems: Installation of single pass cooling systems is prohibited in buildings requesting new water service.

K. No Installation of Non-re-circulating water systems in Commercial Laundry Systems: Installation of non-re-circulating water systems is prohibited in new commercial laundry systems.

L. Restaurants Required to Use Water Conserving Dish Wash Spray Valves: Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

M. Commercial Car Wash Systems: Effective on July 1, 2009, all new commercial conveyor car wash systems must have installed operational re-circulating water systems, or must have secured a waiver of this requirement from the City.

§13.20.070 Phase 1 Water Supply Shortage.

A. A Phase 1 Water Supply Shortage condition exists when the City notifies its water users that due to drought or other supply reductions, a consumer demand reduction of up to 10% is necessary to make more efficient use of water and respond to existing water conditions. Upon the declaration of a Phase 1 Water Supply Shortage condition, the City shall implement the mandatory Phase 1 conservation measures identified in this ordinance. The type of event that may prompt the City to declare a Phase 1 Water Supply Shortage may include, among other factors, a finding that its wholesale water provider calls for extraordinary water conservation.

B. Additional Water Conservation Measures: In addition to the prohibited uses of water identified in Section 13.20.060, the following water conservation requirements apply during a declared Phase 1 Water Supply Shortage:

1. Limits on Watering Days: Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to three days per week on a schedule established and posted by the City. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the City. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2)

gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within seventy-two (72) hours of notification by the City unless other arrangements are made with the City.
3. Other Prohibited Uses: The City may implement other prohibited water uses as determined by the City, after notice to customers.

§13.20.080 Phase 2 Water Supply Shortage.

A. A Phase 2 Water Supply Shortage condition exists when the City notifies its water users that due to drought or other supply reductions, a consumer demand reduction of up to 20% is necessary to make more efficient use of water and respond to existing water conditions. Upon declaration of a Phase 2 Water Supply Shortage condition, the City shall implement the mandatory Phase 2 conservation measures identified in this ordinance.

B. Additional Conservation Measures: In addition to the prohibited uses of water identified in Sections 13.20.060 and 13.20.070, the following additional water conservation requirements apply during a declared Phase 2 Water Supply Shortage:

1. Water Allocations: The City will implement reduced water allocations for property served by the City using the tiered water rate structure currently in effect. Reduced allocations within each tier of the water rate structure will be based on the percentage reduction within each phase of the Water Conservation and Water Supply Shortage Program. This results in lower thresholds within each tier and further encourages conservation. The City must provide notice of the reduced water allocation by including it in the regular billing statement or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for on-going water service.

A tiered water rate structure will be established for any water customers not currently in a tiered water rate structure and will be subject to the same provisions herein.

2. Watering Days: Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two days per week on a schedule established and posted by the City. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the City. This provision does not apply to landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the City. This provision does not apply to two (2) gallons of water per hour. This provision also does not apply to watering or irrigating

by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

3. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the City unless other arrangements are made with the City.

4. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage phase under this ordinance.

5. Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

6. Limits on filling Residential Swimming Pools and Spas: Re-filling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

7. Other Prohibited Uses: The City may implement other prohibitions on water uses as determined by the City, after notice to customers.

§13.20.090 Phase 3 Water Supply Shortage.

A. A Phase 3 Water Supply Shortage Emergency exists when the City declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that up to 30% consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. The City must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.

B. Additional Conservation Measures: In addition to the prohibited uses of water identified in Sections 13.20.060, 13.20.070, and ~~13.20.080,~~ the following water conservation requirements apply during a declared Phase 3 Water Supply Shortage Emergency:

1. No Watering or Irrigating: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited, except as approved by the City.

2. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty-four (24) hours of notification by the City unless other arrangements are made with the City.

3. No New Potable Water Service: Upon declaration of a Phase 3 Water Supply Shortage Emergency condition, no new potable water service will be provided, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability) will be issued, except under the following circumstances:

a. A valid, unexpired building permit has been issued for the project; or

b. The project is necessary to protect public health, safety, and welfare; or

c. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less.

4. Discontinue Service: The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this section.

5. Other Prohibited Uses: The City may implement other prohibited water uses as determined by the City, after notice to customers.

§13.20.100 Phase 4 Water Supply Shortage – Emergency Condition.

A. A Phase 4 Water Supply Shortage Emergency exists when the City declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that up to 40% or more consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. The City must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.

B. Additional Conservation Measures: In addition to the prohibited uses of water identified in Sections 13.20.060, 13.20.070, 13.20.080, and 13.20.090 the following water conservation requirements apply during a declared Phase 4 Water Supply Shortage Emergency:

1. The City may reduce water allocations in all categories to meet the available water supply.

2. The City may shut off all non-essential water uses.

3. Other Prohibited Uses: The City may implement other prohibited water uses as determined by the City, after notice to customers.

§13.20.110 Procedures for Determination/Notification of Water Supply Shortage.

A. Declaration and Notification of Phase 1 and 2 Water Supply Shortage: The existence of Phase 1 and Phase 2 Water Supply Shortage conditions may be declared by resolution of the City adopted at a regular or special public meeting held in accordance with State law. The mandatory conservation requirements applicable to Phase 1 or Phase 2 conditions will take effect

on the tenth (10) day after the date the shortage phase is declared. Within five (5) days following the declaration of the shortage phase, the City must publish a copy of the resolution in a newspaper used for publication of official notices. If the City establishes a water allocation, it must provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for on-going water service. A water allocation will be effective on the fifth (5) day following the date of mailing or at such later date as specified in the notice.

B. Declaration and Notification of Phase 3 Water Supply Shortage: The existence of a Phase 3 Water Supply Shortage Emergency condition may be declared in accordance with the procedures specified in Water Code Sections 351 and 352. The mandatory conservation requirements applicable to the Phase 3 conditions will take effect on the tenth (10) day after the date the shortage phase is declared. Within five (5) days following the declaration of the shortage phase, the City must publish a copy of the resolution in a newspaper used for the publication of official notices. If the City establishes a water allocation, it will provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for on-going water service. A water allocation will be effective on the fifth (5) day following the date of mailing or at such later date as specified in the notice.

§13.20.120 Other Provisions.

A. Limits on Building Permits: the City may limit or withhold the issuance of building permits which require new or expanded water service, except to protect the public health, safety and welfare, or in cases which meet the City's adopted conservation offset requirements.

B. Customer Water Conservation Reports: The City may, by written request, require all commercial, residential and industrial customers using twenty-five thousand (25,000) or more billing units per year to submit a water conservation plan and to submit quarterly progress reports on such plan. The conservation plan must include recommendations for increased water savings, separation of uses including increased water recycling based on feasibility, and the reports must include progress to date on implementation of such recommendations.

C. Reporting Mechanism – Hotline: The City may establish a water waste hotline for residents to report violations of this chapter.

D. State Model Landscape Ordinance: The Department of Water Resources State Model Landscaping Ordinance is adopted by reference and incorporated as part of this Chapter. The full text of the Model Landscaping Ordinance is available on the City's website at www.cityofbrea.net and a copy is maintained with the City Clerk.

§13.20.130 Hardship Waiver.

A. Undue and Disproportionate Hardship: If, due to unique circumstances, a specific requirement of this chapter would result in undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property of classes of water users, then the person may apply for a waiver to the requirements as provided in this section.

B. Written Finding: The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water use due to specific and unique circumstances of the user or the user's property.

1. Application: Application for a waiver must be on a form prescribed by the City and accompanied by a non-refundable processing fee in an amount set by City Council resolution.

2. Supporting Documentation: The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.

3. Required Findings for Waiver: An application for a waiver will be denied unless the City Manager finds, based on the information provided in the application supporting documents, or such additional information as may be requested, and on water use information for the

property as shown by the records of the City or its Agent, all of the following:

a. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;

b. That because of special circumstances applicable to the property or its use, the strict application of this chapter would have a disproportionate impact on the property of use that exceeds the impacts to residents and businesses generally;

c. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the City to effectuate the purpose of this chapter and will not be detrimental to the public interest; and

d. That the condition or situation of the subject property of the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.

4. Approval Authority: The City Manager or designee must act upon any completed application no later than ten (10) days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the

period of the mandatory water supply shortage condition. The decision of the City Manager will be final.

§13.20.140 Penalties and Violations.

A. Violation of any provisions of the ordinance herein must be personally observed by members of the city staff able to personally attest to them. The fines for such violations will be collected on the water bill. Failure to pay a fine amount will be treated as nonpayment of the water bill and water service may be terminated as a result. The fines for such violations are as follows:

1. First Violation: The City will issue a written warning and deliver a copy of this ordinance by mail.

2. Second Violation: A second violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed one hundred dollars ($100).

3. Third Violation: A third violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed two hundred and fifty ($250).

4. Fourth and Subsequent Violations: A fourth and any subsequent violation is punishable by a fine not to exceed five hundred ($500).

   a. Water Flow Restrictor Device: In addition to any fines, the City may install a water flow restrictor device of approximately one gallon per minute.

b. Termination of Service: In addition to any fines, the City may disconnect and/or terminate a customer's water service.

B. Cost of Installing Flow Restrictor or Disconnecting Service: A person or entity that violates this ordinance is responsible for payment of the City's charges for installing a flow restrictor or disconnecting and/or reconnecting service per the City's schedule of charges then in effect. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

C. Separate Offenses: Each day that a violation of this ordinance occurs is a separate offense.

D. Notice and Hearing:

1. The City will issue a Notice of Violation by mail or personal delivery at least ten (10) days before taking enforcement action. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the Notice of Violation by filing a written notice of appeal with the City no later than the close of business on the day before the date scheduled for enforcement action. Any Notice of Violation not timely appealed will be final. Upon receipt of a timely appeal, a hearing on the appeal will be scheduled, and the City will mail written notice of the hearing date to the customer at least ten (10) days before the date of the hearing.

2. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the City may take appropriate steps to prevent the

unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water Phase condition.

SECTION 3. Severability.

If any section, subsection, sentence, clause or phrase in the chapter hereby adopted is for any reason held invalid, the validity of the remainder of the chapter will not be affected. The City Council hereby declares it would have passed this chapter and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or is declared invalid.

SECTION 4.

The City Clerk shall certify to the adoption of this Ordinance.

APPROVED AND ADOPTED this 16th day of June, 2009.

John Beauman
Mayor

I, Lucinda Williams, City Clerk of the City of Brea, do hereby certify that the foregoing Ordinance was introduced at a regular meeting of the City Council of the City of Brea held on the 2nd day of June, 2009 and was finally passed at a regular meeting of the City Council of the City of Brea held on the 16th day of June, 2009 by the following vote:

AYES: COUNCIL MEMBERS: Moore, Schweitzer, Simonoff, Beauman

NOES: COUNCIL MEMBERS: None

ABSENT: COUNCIL MEMBERS: Garcia

ABSTAIN: COUNCIL MEMBERS: None

ATTEST: _____
City Clerk

DATE: 6-24-09

Appendix D

60 Day Notification Letters

City of Brea

March 28, 2011

Mr. Don Hannah, City Manager
City of La Habra
201 East La Habra Blvd.
La Habra, CA 90633-0337

RE: BREA'S 2010 URBAN WATER MANAGEMENT PLAN

Dear Mr. Hannah:

This letter serves as a notification that the City of Brea Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

A draft of Brea's 2010 UWMP will be available for review prior to the public hearing which is tentatively scheduled for May 2011. Please contact us if you would like to have a draft sent to you.

If you would like more information or have any questions, please contact me at (714) 990-7642 or via email at ronkr@ci.brea.ca.us.

Sincerely,

Ron Krause
Water Distribution Superintendent

City of Brea

March 28, 2011

Mr. Ken Vecchiarelli, General Manager
Yorba Linda Water District
1717 E. Miraloma Avenue
Placentia, CA 92870

RE: BREA'S 2010 URBAN WATER MANAGEMENT PLAN

Dear Mr. Vecchiarelli:

This letter serves as a notification that the City of Brea Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

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If you would like more information or have any questions, please contact me at (714) 990-7642 or via email at ronkr@ci.brea.ca.us.

Sincerely,

Ron Krause
Water Distribution Superintendent

City of Brea

March 28, 2011

Mr. Troy L. Butzlaff, City Administrator
City of Placentia
401 East Chapman Avenue
Placentia, CA 92870

RE: BREA'S 2010 URBAN WATER MANAGEMENT PLAN

Dear Mr. Butzlaff:

This letter serves as a notification that the City of Brea Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

A draft of Brea's 2010 UWMP will be available for review prior to the public hearing which is tentatively scheduled for May 2011. Please contact us if you would like to have a draft sent to you.

If you would like more information or have any questions, please contact me at (714) 990-7642 or via email at ronkr@ci.brea.ca.us.

Sincerely,

Ron Krause
Water Distribution Superintendent

City of Brea

March 28, 2011

Mr. Steve Rudometkin, City Manager
City of Yorba Linda
4845 Casa Loma Avenue
P.O. Box 87014
Yorba Linda, CA 92885

RE: BREA'S 2010 URBAN WATER MANAGEMENT PLAN

Dear Mr. Rudometkin:

This letter serves as a notification that the City of Brea Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

A draft of Brea's 2010 UWMP will be available for review prior to the public hearing which is tentatively scheduled for May 2011. Please contact us if you would like to have a draft sent to you.

If you would like more information or have any questions, please contact me at (714) 990-7642 or via email at ronkr@ci.brea.ca.us.

Sincerely,

Ron Krause
Water Distribution Superintendent

City of Brea

March 28, 2011

Mr. Robert Hanford, District Manager
Golden State Water Company
1920 West Corporate Way
Anaheim, CA 92801

RE: BREA'S 2010 URBAN WATER MANAGEMENT PLAN

Dear Mr. Hanford:

This letter serves as a notification that the City of Brea Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

A draft of Brea's 2010 UWMP will be available for review prior to the public hearing which is tentatively scheduled for May 2011. Please contact us if you would like to have a draft sent to you.

If you would like more information or have any questions, please contact me at (714) 990-7642 or via email at ronkr@ci.brea.ca.us.

Sincerely,

Ron Krause

Ron Krause
Water Distribution Superintendent

City of Brea

March 28, 2011

Mr. Joe Felz, City Manager
City of Fullerton
303 W. Commonwealth
Fullerton, CA 92832

RE: BREA'S 2010 URBAN WATER MANAGEMENT PLAN

Dear Mr. Felz:

This letter serves as a notification that the City of Brea Water Utility is currently updating its Urban Water Management Plan (UWMP) in accordance with the Urban Water Management Planning Act of the California Water Code. The Act requires urban water suppliers supplying more than 3,000 acre feet of water annually or providing water to more than 3,000 customers to update their UWMP every five years.

A draft of Brea's 2010 UWMP will be available for review prior to the public hearing which is tentatively scheduled for May 2011. Please contact us if you would like to have a draft sent to you.

If you would like more information or have any questions, please contact me at (714) 990-7642 or via email at ronkr@ci.brea.ca.us.

Sincerely,

Ron Krause
Water Distribution Superintendent

Appendix E

Public Hearing Notice

AFFIDAVIT OF PUBLICATION

STATE OF CALIFORNIA,)
) ss.
County of Orange)

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the **Star- Progress** , a newspaper that has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, on June 15, 2001, Case No. A-55572 in and for the County of Orange, State of California; that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

May 19, 26, 2011

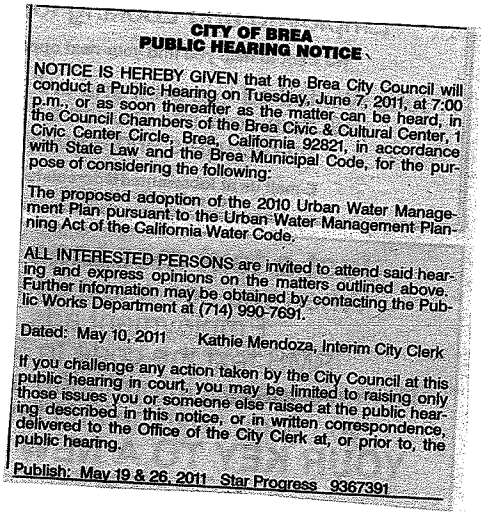
"I certify (or declare) under the penalty of perjury under the laws of the State of California that the foregoing is true and correct":
Executed at Santa Ana, Orange County, California, on

Date: May 26, 2011

Signature

Star- Progress
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-7000 ext. 3002

PROOF OF PUBLICATION



CITY OF BREA
PUBLIC HEARING NOTICE

NOTICE IS HEREBY GIVEN that the Brea City Council will conduct a Public Hearing on Tuesday, June 7, 2011, at 7:00 p.m., or as soon thereafter as the matter can be heard, in the Council Chambers of the Brea Civic & Cultural Center, 1 Civic Center Circle, Brea, California 92821, in accordance with State Law and the Brea Municipal Code, for the purpose of considering the following:

The proposed adoption of the 2010 Urban Water Management Plan pursuant to the Urban Water Management Planning Act of the California Water Code.

ALL INTERESTED PERSONS are invited to attend said hearing and express opinions on the matters outlined above. Further information may be obtained by contacting the Public Works Department at (714) 990-7691.

Dated: May 10, 2011 Kathie Mendoza, Interim City Clerk

If you challenge any action taken by the City Council at this public hearing in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence, delivered to the Office of the City Clerk at, or prior to, the public hearing.

Publish: May 19 & 26, 2011 Star Progress 9367391

Appendix F

Copy of Plan Adoption

RESOLUTION NO. 2011-053

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BREA ADOPTINGTHE 2010 URBAN WATER MANAGEMENT PLAN

A. RECITALS:

(i) The City of Brea is located in the semi-arid coastal plain of Southern California and it is imperative that every reasonable measure be taken to manage precious local and imported water supplies.

(ii) The City of Brea is required to prepare and adopt an Urban Water Management Plan pursuant to California Water Code Section 10620(a).

(iii) The City of Brea has now completed an Urban Water Management Plan in accordance with the requirements of California Water Code Sections 10640, et seq.

(iv) The purpose of the City's Plan is to provide an analysis of the current water conservation activities of the City of Brea.

(v) The City's Plan also addresses the effects of water shortages within the City's boundaries and suggests a framework for developing a mechanism in concert with the Municipal Water District of Orange County and the Metropolitan Water District of Southern California to cope with short-term as well as chronic water supply deficiencies.

(vi) This Council has conducted a duly noticed public hearing in accordance with the requirements of California Water Code Section 10642, which hearing was concluded prior to the adoption of this Resolution.

(vii) All legal prerequisites to the adoption of this Resolution have occurred.

B. RESOLUTION:

NOW, THEREFORE, be it found, determined and resolved by the City Council of the City of Brea as follows:

1. In all respects as set forth in the Recitals, Part A, of this Resolution.

2. The Urban Water Management Plan dated May 2011, a full, true and correct copy of which is attached hereto, is hereby adopted in its entirety as the 2010 Urban Water Management Plan of the City of Brea.

3. The City Manager hereby is directed to ensure implementation of the Plan in accordance with the implementation schedule set forth in said Plan.

4. The City Manager shall cause periodic reviews of said Plan to occur and to present to this Council any changes or amendments in said Plan which are indicated by such review in accordance with the requirements of the Urban Water Management Planning Act, California Water Code Section 10610, et seq.

5. The City Clerk shall:

a. Certify to the adoption of this Resolution; and

b. File a certified copy of the Plan adopted hereby with the California State Department of Water Resources.

APPROVED AND ADOPTED this 7th day of June, 2011.

Mayor

I, Kathie Mendoza, Interim Clerk of the City of Brea, do hereby certify that the foregoing Resolution was adopted at a regular meeting of the City Council of the City of Brea held on the 7th day of June, 2011 by the following vote:

AYES : COUNCIL MEMBERS: Garcia, Murdock, Simonoff, Schweitzer, Moore

NOES: COUNCIL MEMBERS: None

ABSENT: COUNCIL MEMBERS: None

ABSTAIN: COUNCIL MEMBERS: None

ATTEST: Kathie Mendoza
Interim City Clerk

8001 Irvine Center Drive, Suite 1100
Irvine, CA 92618
949.450.9901 Fax 949.450..9902

MALCOLM PIRNIE | ARCADIS

The Water Division of ARCADIS